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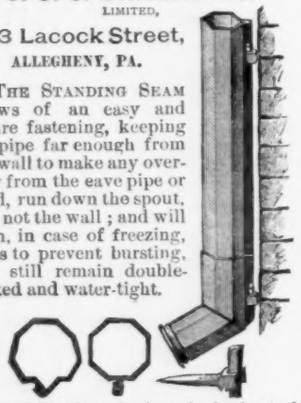

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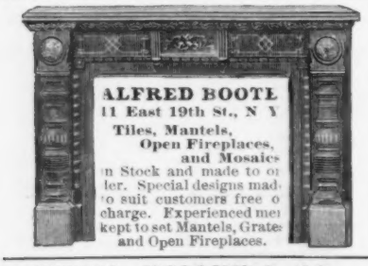

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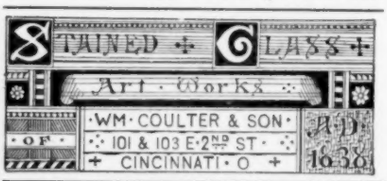

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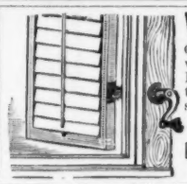

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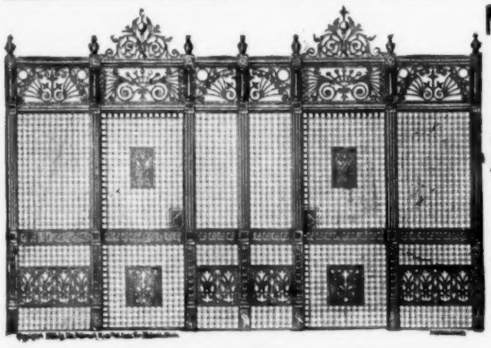

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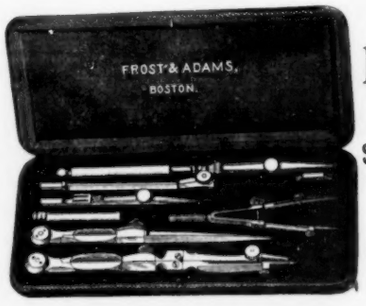

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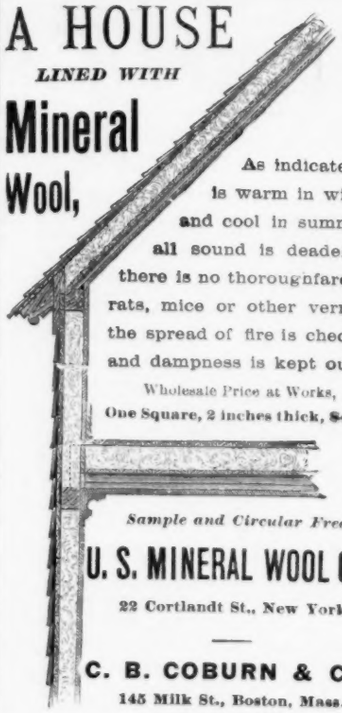

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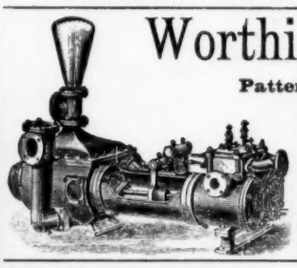

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BRICK.—₱ M.	New York. (*Wholesale Prices.*)	Boston.	Chicago. (*Prices to Builders and Contractors.*)	Philadelphia.
Common: *Cargo afloat.*				
Pale	$3 00 @ $3 50	Eastern	Building Brick	Hard
Jersey	5 50 @ 6 00	7 00 @ 7 50	6 00 @ 7 00	@ 8 00
Long Island	@	Bay State Hard		Salmon
Up River	5 75 @ 6 37½	9 00		@ 6 00
Haverstraw Bay	6 25 @ 6 50	Domestic Com.	Indiana Pressd	Scratchers
" 1st	6 50 @ 6 75	8 00 @ 9 00	16 00 @ 28 00	@ 11 00
Hollow	@ 13 00	Domestic Face	St. Louis Fronts	Pressed
Fronts:		19 00 @ 20 00	@ 27 00	20 00 @ 23 00
Croton, Brown	12 00 @ 13 00	Philadelphia		End Headers, all colors
" dark	13 00 @ 14 00	40 00 @ 45 00		@ 65 00
" red	13 00 @ 14 00	Phila. mould		Edge & End all colors
Chicago pressed		50 00 @ 80 00	22 00 @ 29 00	@ 85 00
Chicago Moulded			65 00 @ 350 00	
Baltimore	37 00 @ 41 00		@ 50 00	
Glens Falls—white	30 00 @ 35 00	Glens Falls		
Philadelphia	24 00 @ 25 00	25 00 @ 26 00	@ 45 00	
Trenton	24 00 @ 25 00		38 00 @	
Milwaukee		Glens Falls	25 00 @	
Moulded:		Mould.	60 00 @ 100 00	
Clark's Glens Falls—Red	25 00 @ 27 00	30 00 @ 35 00	30 @	
" —White	30 00 @ 35 00	35 00 @ 40 00	35 @	
White " Mold,	45 00 @ 60 00	45 00 @ 60 00	55 00 @ 65 00	
Enamelled: *Imp.*				
Enamelled (edge.)	85 00 @ 100 00	@	@ 100 00	Dom. @ 65
Enamelled (edge and end)	90 00 @ 115 00	@	@ 120 00	Dom. @ 85
CEMENT, LIME, etc.—(₱ *cask.*)				
Rosendale Cement	95 @ 1 00	@ 1 40	*Not Sold.*	1 50 @ 1 75
Utica, Akron, Buffalo, Louisville, Milwaukee	*Not sold.*	*Not sold.*	1 00 @ 1 25	*Not sold.*
Portland, English (Gibbs)	2 50 @ 3 10	@ 3 20	3 00 @ 3 25	@ 3 50
" " (K. B. & S.)	2 75 @ 3 10		3 25 @ 3 50	@ 3 25
" " (Burham)	2 50 @ 2 80		3 15 @ 3 35	@ 3 00
" " (White's)	2 85 @ 3 00			
" German (Alsen)	2 50 @ 3 00	3 00 @ 3 50	3 15 @ 3 35	@ 25
" " (Fewer)	2 45 @ 2 70	3 15 @ 3 35	3 15 @ 3 35	
" " (Vorwohler)	2 50 @ 3 25		3 00 @ 3 25	
" " (Dyckerhoff)	2 75 @ 3 15	3 00 @ 3 50	3 25 @ 3 50	3 00 @ 3 2
" " (Lagerdofer)	@ 2 70	*Not sold.*	*Not sold.*	*Not sold.*
" " (Hanover)	2 50 @ 3 00		3 15 @ 3 35	2 50 @ 3 00
" French (Lafarge)	3 50 @ 4 50	*Not sold.*	3 75 @ 4 25	4 50 @
" American (Saylor's)	2 15 @ 2 30	2 15 @ 2 50	2 75 @ 3 00	2 50 @ 3 00
Selenitic		1 65	*Not sold.*	
Roman	2 75 @ 3 00	@ 3 20	2 75 @ 3 25	3 50 @ 3 75
Keene's coarse	5 00 @ 6 50	@ 7 50	8 00 @ 9 00	6 50 @ 7 00
" superfine	8 75 @ 11 00	@ 11 50	12 00 @ 13 00	11 50 @ 12 00
Lime:				
Lime of Teil	@ 5 00		*Not sold.*	
Hydraulic Lime	@ 1 45	@ 145		
Chicago Lime in bulk			65 @ 75	White Mash
Wisconsin "			75 @ 85	1 25 @ 150
Rockland and Rockport, (Com.)	@ 1 00	@ 1 15	*Not sold.*	1 00 @ 1 00
Rockland and Rockport, finish	@ 1 20	@ 1 20	*Not sold.*	
State, com. cargo rates (nom.)	@ 90	*Not sold.*	*Not sold.*	*Not sold.*
State, finishing "	@ 1 10	*Not sold.*	*Not sold.*	*Not sold.*
Plaster of Paris (calcined.)	@ 1 25	1 65 @ 1 90	@ 1 75	2 00 @ 2 25
" (casting)	@ 1 35	@ 2 25	@ 1 75	2 25 @ 2 50
Hair (Cattle) ₱ *bush.*	21 @ 25	@ 30	20 @ 25	20 @ 25
" (Goat)	30 @ 35	@ 30	35 @ 40	28 @ 33
Sand, ₱ *load*	1 00 @ 1 25	@ 1 50	100 @ 1 25	@ 1 50
STONE. (₱ *cubic foot, rough.*)				
Granite: (*Maine*)		@ 60		@ @ 2 00
Limestone:				
Bedford	@ 1 00	95 @ 1 00	50 @	3 75 @
Joliet	@		50 @ 55	
Lemont	@		35 @ 60	
Serpentine			80 @ 90	75 @ 1 25

(*Continued on page vi.*)

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	New York. (*Wholesale Prices.*)	Boston. (*Prices to Builders and Contractors.*)	Chicago.	Philadelphia
Foundation:				
Dimension	@	5 00 ℔ ton	20 @ 28	30 @ 5 00
Block	@	4 60 ℔ perch	8 50 ℔ cord.	50 @ 6 00
Rubble	@	1 25 @ 1 50	8 50 @	
Bluestone: (℔ *sq. ft.*)				
Sidewalk	30 @ 5 00	40 @ 1 75	75 @ 1 00	70 @ 90
Planed	50 @ 6 00	75	50 @ 1 00	1 10 @ 1 25
Sandstone,				
Longmeadow		75 @ 85		
Kibbe		85 @ 95		
Brown (Connecticut)	1 00 @	1 25 @ 1 45	1 50 ℔ cub.ft.	1 35 @ 2 00
Amherst } Ohio	90 @ 95	90 @ 1 00	55 @ 65	90 @ 1 10
Berea } Ohio	75 @ 1 00	80 @ 90	45 @ 55	
Berlin } Ohio	75 @ 1 00	80 @ 90	55 @ 65	
Belleville	80 @ 1 25	1 25 @ 1 35	"	
New Brunswick and Nova Scotia	@ 1 00	75 @ 1 00	"	
Caen	@	@ 2 00	"	
Marble (℔ *cu. ft.*)				
Lee, Mass	@	1 75 @ 2 50	*Not sold.*	2 00 @ 2 50
Rutland, white	@	@ 3 00	3 50 @ 6 00	2 25 @ 2 50
Sutherland Falls	1 25 @ 1 75	@ 2 00	3 50 @ 6 00	2 50 @ 4 00
Glens Falls, black	@	2 00 @ 3 00	*Not sold.*	4 00 @ 4 50
Italian, blue-veined	@	50 @ 60	@ 4 40	— @ —
" Sienna	@	3 00 @ 3 50	*Not sold.*	3 25 @ 6 50
Tennessee, red	@	1 25 @ 2 50	@ 4 00	2 00 @ 3 00
" Knoxville	@	85 @ 90	@ 4 00	@ 1 50
Pennsylvania, blue	@		*Not sold.*	2 23 @ 2 50
Vermont, white	@	1 50 @ 2 00	3 50 @ 6 00	
Slate: Roofing (℔ *square*)	7 @ 8 00	4 50 @ 7 00	6 25 @ 8 10	6 25 @ 7 00
" green	@ 5 75	@ 5 75		
" " unfading	7 00 @ 8 50	5 50 @ 6 50	@ 8 60	@ 7 00
" purple	@ 15 00	13 00 @ 14 00	— @ 16 00	@ 12 00
" red	— @ —	Brownville, Me.	7 20 @ 7 60	@ 4 00
" black, Lehigh	— @ —	6 50 @ 9 00	7 30 @ 8 00	@ 4 50
" " Chapmans	5 50 @ 8 00	5 50 @ 8 00	6 00 @ 8 50	5 50 @ 8 00
" Unfading Black, Monson, Me.	@		*Not sold.*	@ 15 00
Tiles, Am. ℔ M.				@ 3 85
N. Peach Bottom, warranted unfading				
LUMBER.—℔ M.				
Boards: (*Ordinary dimensions.*)				
Pine, 1st quality, clear	65 00 @ 75 00	50 00 @ 60 00	44 00 @ 46 00	65 00 @ 75 00
" 2d quality	55 00 @ 60 00	42 00 @ 48 00	40 00 @ 44 00	55 00 @ 60 50
" 3d quality	18 00 @ 22 00	35 00 @ 40 00	37 00 @ 42 00	18 00 @ 22 00
Spruce	@ 25 00	11 00 @ 14 00	*Not sold.*	@ 22 50
Hemlock	ea. 17 @ 18	11 00 @ 12 50	@ 10 00	12 50 @ 15 00
Yellow pine	20 @ 40	30 00 @ 38 00	@ 28 00	17 00 @ 20 00
Cypress	@	32 00 @ 40 00	@	40 00 @ 55 00
Clapboards:				
Pine	@	33 00 @ 55 00	9 00 @ 20 50	—@—
Spruce	@	23 00 @ 35 00	*Not sold.*	—@—
Framing Timber:				
Pine			10 50 @ 14 50	25 00 @ 35 00
Spruce	13 50 @ 16 00	13 50 @ 15 00	*Not sold.*	18 50 @ 20 00
Hemlock	12 00 @ 15 00	@	10 00 @ 13 00	12 00 @ 13 00
Yellow pine	18 00 @ 25 00	23 00 @ 26 00		25 00 @ 30 00
Laths:				
Pine	@	2 25 @ 2 35	1 75 @	—@—
Spruce	@ 2 15	2 00 @ 2 25	*Not sold.*	2 35 @ 2 40
Shingles:				
Pine, shaved ℔ M.	5 00 @ 6 00	@	*Not sold.*	
Pine, sawed "	4 00 @ 5 00	@ 4 50	1 85 @ 2 45	
Spruce, sawed "	1 50 @ 2 00	@ 1 50	*Not sold.*	
Redwood ℔ 125	1 40 @ 1 60	3 75 @ 4 50	5 50 @ 8 00	{30" $10 @ 28
Cedar, split ℔ M.	@	@	*Not sold.*	{24" 8 @ 21
Cedar, sawed "	@	2 00 @ 4 00	@ 2 00	{20" 5 50 @ 14
Cypress. Split....7 x 24. "	18 00 @ 20 00	5 50 @ 6 00	4 00 @ 4 50	13 00 @ 20 00
Miscellaneous:				
Piles ℔ ft.	4½ @ 5½	Piles 6c. ℔ ft.	*Not sold.*	
Fence pickets, Spruce	8 00 @ 10 00	10 00 @ 18 00	Pine, 8 @ 21	12 00 @ 14 00
Cedar posts, 9 ft. (sq. posts.)	@	25 @ 35	9 00 @ 21 00	70 @ 1 25
Chestnut "	@	25 @ 35	*Not sold.*	28 @ 36
Finishing Woods: ℔ M. (*First Qual. Kiln-dried.*)				
Ash	@ 55 00	38 00 @ 48 00	35 00 @ 40 00	45 00 @ 50 00
Cherry	80 00 @ 120 00	60 00 @ 90 00	75 00 @ 85 00	65 00 @ 90 00
Chestnut	@ 55 00	38 00 @ 50 00	45 00 @ 50 00	60 00 @ 80 00
Butternut	40 00 @ 60 00	60 00 @ 70 00	50 00 @ 60 00	70 00 @ 85 00
Mahogany, Baywood	@ 180 00	150 00 @ 160 00	150 00 @ 180 00	120 00 @ 150
" St. Domingo	@ 350 00	120 00 @ 350 00	250 00 @ 300 00	
Maple	45 00 @ 50 00	45 00 @ 65 00	30 00 @ 35 00	30 00 @ 50 00
Oak, red	@ 70 00	@ 50 00	35 00 @ 40 00	35 00 @ 45 00
" white	@ 70 00	@ 55 00	35 00 @ 40 00	55 00 @ 65 00
" quartered	@ 90 00	65 00 @ 70 00	45 00 @ 50 00	70 00 @ 80 00
Sycamore quartered		50 00 @ 65 00	45 00 @ 50 00	70
Pine, clear	65 00 @ 70 00	30 00 @ 65 00	45 00 @ 50 00	65 00 @ 90 00
Redwood	60 00 @ 70 00	60 00 @ 70 00	56 00 @ 65 00	100 00 @
Rosewood ℔ lb.	@ 6		@ 7	
Walnut, black	125 00 @ 150 00	85 00 @ 120 00	80 00 @ 100 00	160 00 @ 200 00
Whitewood	45 00 @ 50 00	38 00 @ 45 00	30 00 @ 35 00	20 00 @ 30 00
Yellow pine ℔ M.	@ 45 00	40 00 @ 45 00	30 00 @ 35 00	30 00 @ 35 00
Gumwood, best red			30 00 @ 35 00	
PAINTS. (*In oil,* ℔ *lb.*)				
White lead, Am.	@ 6½	@ 6½	@ 6½	5 @ 6½
" Zinc, "	5 @ 8	@ 8	7 @ 11	4 @ 6
Red lead, Am.,	6 @ 6½	6 @ 6½	@ 6½	
" Venetian	6 @ 10½	7 @ 12	1½ @ 2½	6 @ 8
" Vermilion	65 @ 70	55 @ 60 dry	55 @ 60	Am. 14 @ 22
Red Indian, Eng.	12 @ 20	12 @ 20	12 @ 20	12 @ 18
Yellow Ochre	6 @ 15	7 @ 12	3 @ 15	7 @ 9
" Chrome	12 @ 20	18 @ 25	12 @ 25	12 @ 25
Green (chrome)	8 @ 13	8 @ 20	8 @ 20	9 @ 15
Green, Paris,	25 @ 40	25 @ 40	16 @ 35	18 @ 22
Black, lamp	15 @ 23	15 @ 25	8 @ 30	8 @ 12
Blue, ultramarine	12 @ 18	18 @ 30	10 @ 35	11 @ 35
Oil, linseed, (raw) (℔ gal.)	45 @ 47	48 @ 53	46 @ 48	52 @ 55
" " boiled	47 @ 49	51 @ 56	49 @ 51	57 @ 59
Turpentine	37 @ 39	42 @ 49	41 @ 43	45
Varnish, coach		1 50 @ 6 00	1 25 @ 2 00	1 75 @ 5 25
Shellac		2 50 @ 3 00	3 25 @ 4 00	1 10 @ 1 75
Putty ℔ lb.	2 @ 3	2 @ 4	02 @ 03	2 @ 2½
Whiting ℔ cwt.	60 @ 65	1 @ 1½	1 @ 2	1 @ 1½
Paris white, (Eng.,) dry	2 @ 3	2 @ 3	2 @ 2½	1½ @ 1½
Litharge, Am.	5½ @ 5½	6½ @ 7	6½ @ 10	6½ @ 7½
Sienna (burnt)	12 @ 17½	14 @ 20	4 @ 16	9 @ 14
Umber, "	11 @ 16½	14 @ 20	2 @ 10	9 @ 14

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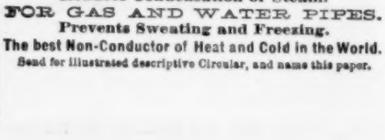

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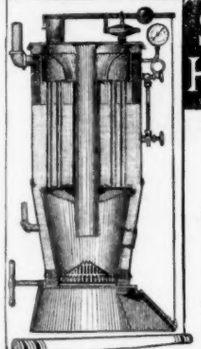

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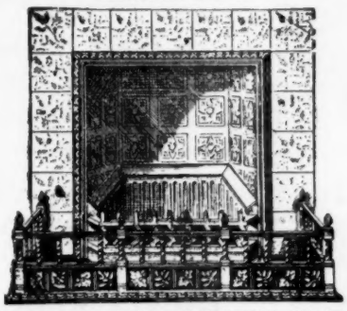

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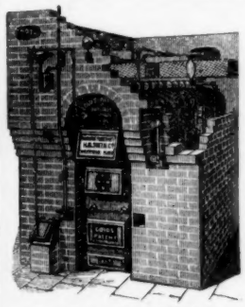

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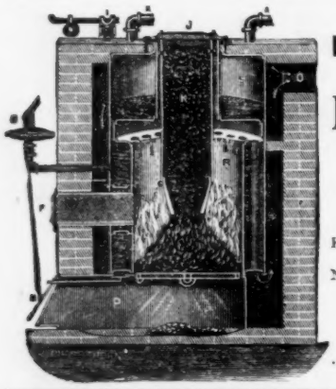

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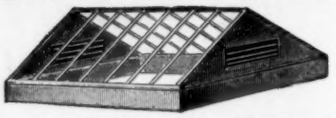

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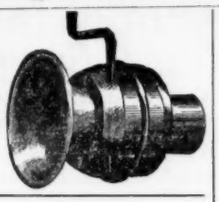

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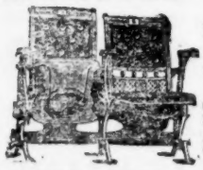

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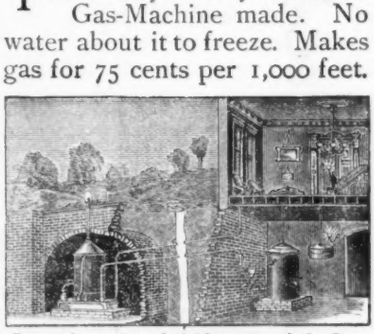

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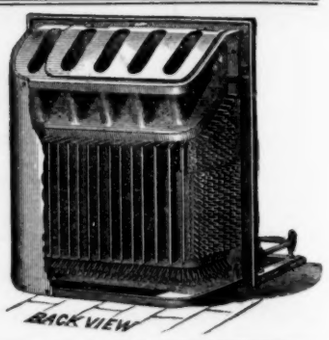

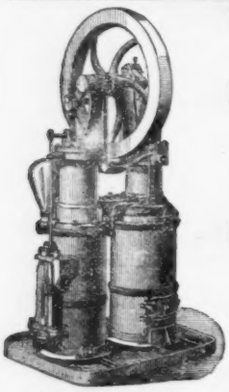

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AUGUST 8, 1885.

Entered at the Post-Office at Boston as second-class matter.

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NOTES AND CLIPPINGS. 70

THE *Fireman's Journal* gives some statistics in regard to the causes of fires during the year 1884, compiled from the annual volume published by the New York *Chronicle*, and illustrated by a diagram showing the aggregate number of fires due to each of the twenty-seven principal causes arranged as segments of a circle. The largest segment, of course, is occupied by Incendiarism, which is charged with nearly thirty per cent of all the fires. The next, taking in an area rather more than one-third as great as that of incendiarism, is the segment devoted to Defective Flues, the euphemism, as we consider it, for the natural result of criminal dishonesty or stupidity on the part of bricklayers. The third place in the list seems to be disputed between Matches and Explosions of Lamps and Lanterns, but these are closely followed by Lightning and Sparks. Indeed, sparks from locomotives and other sources together set more fires than anything else except defective flues and incendiarism. Hot stoves and stove-pipes cause about as many fires as spontaneous combustion, and next to these the carelessness of tramps is the most efficient factor in destroying combustible property. Fireworks and fire-crackers cause many conflagrations, although not so many as either tramps or unprotected gas-jets, and not many more than neglected cigar-stumps. In regard to the character and value of the buildings destroyed, we find that dwelling-houses head the list, about one of these being burned every hour in the United States, with an average loss of thirteen hundred and ninety-six dollars. Next in number come the fires in barns and stables, of which fifty are consumed every week, but the amount of property destroyed in them is far exceeded by that burned up in country stores, which disappear at the rate of three a day, carrying off with them one hundred and ten thousand dollars a week. More than ten hotels a week vanish into smoke, and with them nearly forty-four hundred thousand dollars a year; and one flour mill, with twelve thousand dollars worth of some one's property, burns up every working day. Lumber yards stand next in rank, for, although fires in these occur only about once in two days, the average loss in each is more than twenty thousand dollars. It is singular that the number of fires, and the average loss in each case, is almost exactly the same for cotton-factories, woolen-mills and chemical-works, the number of fires in the first during the year having been forty-four, in the second forty-three, and in the third forty-two, while the average losses were approximately twenty-eight, twenty-five and twenty-seven thousand dollars in the three classes. In number, boot and shoe factories approach the others, forty-two having been destroyed, but the average loss in these is only seventeen thousand five hundred dollars. Five theatres a month have been burned, with an average loss of about nineteen thousand dollars, and about half as many court-houses, with nearly the same average loss. Looking at the statistics with regard to the locality of fires, it appears, as the *Fireman's Journal* says, that the losses from this cause last year amounted in the State of Georgia to more than the whole cost of carrying on the State Government, including the interest on the public debt.

ONE of those curious ordinances which the envious imagine to have been devised for the purpose of levying tribute from those whose interest lies in disobeying them, forbids the hoisting of safes into the windows of buildings in the city of New York. As safes, however, must be used in buildings, and as the best, if not the only practicable way in many cases of getting them into buildings is to hoist them from the sidewalk into the windows, the ordinance has never been generally enforced until the other day, when notice was served on the Marvin Safe Company, one of the principal manufacturers in the city, to refrain from delivering goods in this way. The Marvin Company, instead of compromising the matter, prepared for open resistance, and applied for an injunction to restrain the city authorities from enforcing the rule, on the ground that the prohibition of the ordinary mode of delivering safes would ruin its business. A preliminary injunction was granted, but a subsequent motion to make the injunction permanent is still under consideration, with, we should say, the chances against the Safe Company, which would have shown itself more prudent, as well as more public-spirited, if it had opposed the original passage of the ordinance, or had secured its speedy revocation, in the interest of all the manufacturers as well as its own.

WE learn that the competition for the Court-House at Richmond, Va., has been decided by the award of the first prize to Messrs. Wait & Cutter, architects, of Boston. We hardly know whether to congratulate either Messrs. Wait & Cutter or the good people of Richmond on the result of a competition which we should have been glad to see very differently managed; but we can at least offer to all of them our sincere good wishes and hope that what we believe to have been a mistake in the beginning may be so far amended, as the work goes on, that the capital of the ancient State which all of us hold in so much regard may, after all, be adorned with a building worthy of its surroundings, and that the architects may find themselves encouraged to put forth such patient skill and effort as shall earn for them the highest praise of all who see their work.

A CORRESPONDENT of the *Metal Worker*, a chemist, whose attention had been attracted by the persistent assertions of certain manufacturers of wrought-iron stoves and furnaces that cast-iron articles of the kind were dangerous to use, on account of their property, when heated, of allowing carbonic-oxide gas to "pass freely" through their pores, recently undertook a series of experiments to satisfy himself whether this gas really did or did not escape through the metal of cast-iron furnaces and other heating apparatus. Among the various tests for carbonic oxide, he chose one which would detect with certainty one part in twenty-five hundred of air, and proceeded to apply it under as many different conditions as possible. Inquiry was made for houses in which the air was supposed to be contaminated by furnaces or stoves, and a considerable number of buildings were examined, some of which, as the writer says, contained as bad furnaces as could be found anywhere. The air in many of the houses was very unpleasant, and no doubt unwholesome, but its deleterious quality was in all cases due to something else than carbonic oxide, which, although the air at the very mouth of the registers was tested with great care, was not detected in a single instance. Whether carbonic oxide might not have been present in smaller proportions than one to twenty-five hundred is uncertain, no reliable test being known for smaller quantities, but as this quantity is regarded by most physiologists as entirely harmless, and is, at all events, less than the proportion usually present in rooms where cigars or pipes have been smoked, it seems to be plain that poisoning by the carbonic oxide exuded from the pores of cast-iron furnaces must be, at least, a very rare occurrence. To try the experiment in a different way, the *Metal Worker's* correspondent then had a stove constructed in such a way that plates of cast-iron of different thicknesses could be set in it, and a metallic funnel was arranged to draw off the air in contact with the plates, and convey it, by means of an aspirator, to a convenient place for testing. The stove was then heated with coal nearly to whiteness, the dampers were closed, so as to prevent the chimney draught from carrying off any

carbonic oxide which might be disposed to get out through the pores of the iron, and the air in contact with the heated upper surface slowly collected during an hour and a quarter. At the end of that time, an examination showed no trace of carbonic oxide in it. The experiment was then three times repeated, but the air was taken from the side plate of the stove, in contact with the hot coals. In the first case, the plate was three-eighths of an inch thick, in the second it varied from one-eighth to one-quarter of an inch, and in the third it was one-sixteenth of an inch, but in no case, although the plates were kept at or near white heat, could the smallest indication of carbonic oxide be found in the air which had passed slowly over them.

THESE experiments, although recent, and made in such a way as to seem particularly convincing, are not the first which have failed to confirm the theory that carbonic oxide could pass through cast-iron. It seems, from another letter in the *Metal Worker*, that the famous experiment of Deville and Troost was made by placing a closed cast-iron tube over a row of Bunsen burners, and keeping it at a white heat for some time. On cooling it, and examining the air inside it, a trace of carbonic oxide was found. No one else has, we believe, ever obtained the same result in repeating the experiment, and it is generally believed by chemists that the carbonic oxide discovered in the first trial, instead of getting through the pores from the outside, was formed in the tube, by the action of the oxygen of the contained air upon the carbon of the iron, but the publicity given to the supposed discovery by its announcement in the proceedings of the French Academy immediately created a demand for wrought-iron heating-apparatus, which the shrewd manufacturers of such objects have been only too ready to stimulate and supply, at a profit of many thousands, if not millions of dollars to themselves, and to the cost of their customers, whose dread of the purely imaginary evils of cast-iron furnaces has kept them for fifteen or twenty years contented with unscientific, inefficient and wasteful wrought-iron apparatus, at prices for which they could have purchased far better ones of the old kind. It is true that some of the best plate-iron furnaces provide an extent of radiating surface which gives them the same advantages that are possessed by the cast-iron ones, but this is done at great expense, and the heating part of most wrought furnaces consists simply of a short closed cylinder turned down over the fire, without the smallest attempt at economizing the heat of combustion, at extending the radiating surface to increase the quantity and reduce the temperature of the air delivered, or at presenting the radiating surfaces at advantageous angles with the direction of the currents of hot gas, all of which are regarded as important objects, by experienced and scientific manufacturers of heating apparatus, and are easily and cheaply obtained with cast-iron.

THE *Scientific American*, an excellent authority on such points, makes some comments upon a recent decision in a telephone suit which are of interest to those who use this great invention. The suit to which it refers was brought by the American Bell Telephone Company, in the United States Court in Pittsburgh, against the Western Telephone Company, to restrain the latter by injunction from infringing the patent rights claimed by the plaintiff. The argument for the defence would have been that the instrument used by the Western Telephone Company was substantially the same as that which was invented and described by Philip Reis, more than twenty years before the date of the Bell patent, and is now common property, but the court, after hearing the plaintiff's argument, refused to listen to anything whatever from the defence, saying that as the question at issue had already been passed upon by two eminent judges, it would not venture, especially upon so trivial a matter as a preliminary injunction, to reopen it. As we understand, the Bell Company has never denied that Reis thought out and described an electrical talking-machine long before Professor Bell turned his attention to the subject; but it claims that Reis's invention was based upon an erroneous principle, and that a telephone constructed in accordance with his theory could not be made to work; and on what appeared to be satisfactory proof of this, Professor Bell's patent, for an instrument that did work, was confirmed to him as giving him a monopoly for seventeen years of "the electrical transmission of speech," by any method whatever. The Western Telephone Company claims, however, in the present case, that telephones on the Reis principle will, and do, transmit speech intelligibly, and if this can be proved, as the *Scientific American* says, "the patent of Bell will be reduced to its proper rank: that of a subordinate improvement." As other telephones have been invented, notably that of Professor Dolbear, which differ entirely in principle from that of Bell, and are only kept out of the market by the decree which gives the latter control over all forms of electrical transmission of speech, the establishment of the practicability of the Reis telephone, and the consequent limitation of the Bell monopoly to a particular device, would naturally be followed by the introduction of many new, and probably improved forms of telephone, much to the advantage of the public. It is hardly likely, as the Pittsburgh case shows, that the decision of Judges Gray and Wallace will be questioned in the inferior courts, unless some new and very striking evidence should be brought forward; but, as the *Scientific American* points out, the Supreme Court of the United States has never yet passed upon the subject, and the question, if brought before it, would be decided upon its merits, without regard to the opinions of inferior tribunals. Whether the Western Telephone Company, or any one else, has confidence enough in the strength of its position to bring its case to Washington, or whether any controversy with the rich and powerful Bell Company would reach that stage before being settled by purchase or compromise, is doubtful, but we imagine that most disinterested persons would be glad to see the present telephone service improved and cheapened under the stimulus of competition.

A RATHER singular trial took place recently in England, which has furnished the text for many commentaries in the newspapers. It seems that a certain person owned a "desirable villa residence" in that sanitary Paradise, Croydon. The desirable residence, which went under the attractive name of Abbottswood, was leased by the owner to a Mr. Saunders, at a rental of four hundred dollars a year, with the assurance that the house was "in perfect sanitary condition," and that the plumbing had been carried out under the supervision of the local authorities. Not long after the tenant moved into the house, his gardener, cook, and stepson were taken ill, and last of all his wife, a person with an income of five thousand dollars a year for life, was attacked with "blood-poisoning," and died. In some way, the details of which are unfortunately not given, it was discovered that the demise of Mrs. Saunders and her income, together with the afflictions of the rest of the family, were "caused by faulty drainage arrangements," and suit was brought against the owner of the house for damages. The local health officials testified that they had inspected the drainage of the house after its completion, "and had not raised any objection to it," but the jury, to whom, as to Englishmen in general, the loss of an income secured by marriage probably appeared an unbearable calamity, returned a verdict that the owner of the house had "induced the plaintiff to take it by false and fraudulent statements," and condemned him to pay to Mr. Saunders ten thousand dollars as damages, besides eleven hundred more to the court in the form of costs. There are several remarkable things in this case, about which we forbear to say anything, but it is worth while to call attention to the fact that the implied, if not express certificate of the Croydon inspectors that the plumbing and drainage was perfect seems to have availed the owner nothing in his defence against the enormous claim made upon him. We have often heard it said that building and plumbing laws relieved architects as well as owners who built under them from all responsibility; and that the same power which took away discretion from them, and vested it in an inspector, virtually guaranteed the competency of the inspector, and the correctness of his judgment, as well as the adequacy of the laws; but this case shows that it is the owner who must shoulder the consequences not only of his own acts, but of those of the legislators who make the statutes and the officers who execute them. In most cases like the present one he would be perfectly ignorant about the drainage works of his house, and, relying upon the favorable action of the official inspectors, would have asserted it to be in proper sanitary condition with perfect good faith, and it is rather startling to find that in spite of all this he would stand in constant risk of being ruined if a rich female should happen to die in his house of any of the numerous diseases which popular fancy attributes to the effect of "sewer-gas."

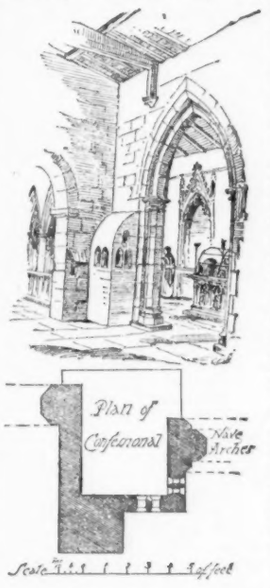
PECULIARITIES OF COUNTRY CHURCHES IN ENGLAND. — II.[1]

ONE feature that has given rise to a great deal of discussion and argument is that of the chancels whose side walls do not run in the same direction as the walls of the nave or aisles. I think I am correct in saying that there are more churches with "crooked" chancels than with straight. Sometimes the direction in which the chancel slopes is to the north, sometimes to the south, or east, occasionally it is so slight that it can hardly be noticed from the interior, and one has to mount to the ridge of the nave, and look along the two ridges together before one can be sure whether the chancel slopes or not, for when the curiosity is aroused on a subject like this, it takes every opportunity to endeavor to satisfy itself as to the fact. Some chancels have so decided a slope that the attention is called to it instantly. All sorts of theories have, of course, been submitted in explanation; some of them most ingenious, but all more or less fallacious, as we shall see. The one held by the greatest number of people is that the deeply-religious masons intended the sloping chancel to represent the bowed head of the dead Saviour on the cross; but if that were the case, surely they would have decided towards which side the head would have fallen, and would have made all the chancels incline the same way. If the chancel represents the head of the Saviour what is there to show the head of the cross; and why should only the head be indicated and no other part. It would have been easy to add little chapels here and there to mark the position of the sacred limbs that projected beyond the straight lines of the cross, and there is no less reason for so doing, than for marking the inclined head. Again, the chancels of many churches which are not cruciform on plan, slope, and there is no sense in making a "fallen head," where the rest of the church has nothing to do with the form of a cross. Others, dissatisfied with this theory, have suggested that the chancel always inclined towards the cathedral of the diocese, and this they thought would get over the difficulty arising from the fact that the inclinations is sometimes to the one side and sometimes to the other; but it is only necessary to look at half-a-dozen churches in the same diocese, when it is seen that they do not agree to point in the same direction, and no further argument is necessary to prove the fallacy of that theory. Another idea is that, for the chancel, the builders were more careful to obtain correct orientation, and this at first sight may be considered reasonable enough, but unfortunately, upon examination it is discovered that many churches have their naves more nearly due east and west than their chancels. Savants have exercised themselves upon this as much as they have upon the question, "Why did the Romans make their roads straight?" but in neither case has a satisfactory solution been arrived at. Only three years ago a learned man, in connection with the London University, gave out his theory that the Roman roads were straight because the chariots were difficult to turn, and that consequently to obviate this the roads were made without curves. There are exceedingly simple answers, I think, to both these questions. The Romans had common sense enough to know that if they wanted to reach a particular point the shortest way there was to go straight; and as to the question about the chancels, most probably the builders erected them under the impression they were continuing in the same lines as the nave; but did not trouble themselves to set their work out exactly, and so it is to chance that we owe this peculiarity, and so there is no symbolism in it at all.

Let us now turn our attention to the internal arrangements, and we shall find some very curious details; the more interesting because they are less known. In the neat little church of Burton Joyce in Nottinghamshire, the chancel is added to the body in an unusual manner. The body consists of a nave with three arches, and an aisle on either side. The south wall of the chancel is a continuation of the line of arches of the south side of the nave, but the north wall is about five feet to the north of the nave's other arches; so that the chancel is five feet wider than the nave, and the additional width is all on the north side. The chancel arch therefore is at one side of the centre line, and a wall pierced with a pointed arch separates the addition of the chancel from the north aisle. This end of the north aisle was once used as a chapel, there being a piscina in the pier that supports the first arch. At West Tanfield, Yorkshire, the church contains a large niche with a small opening at the side like a confessional in the pier supporting the first arch on the north side of the church. It is a very unusual position for a confessional, indeed to have a confessional built in a wall is very uncommon, but no one knows the original purpose of the feature. In this church are the tombs of the great Marmion family, the subject of the poem of Sir Walter Scott, and they stand near this "confessional" and I am inclined to think that it must have been used as a watch-place by the pious monks who chanted the requiems for the repose of the Marmions' souls.

West Tanfield, Yorkshire.

"Leper squints" and "dole windows" or doors are comparatively common, but there are very few places now where a weekly or monthly dole to the poor inhabitants is still distributed by bequest. At Sawley, in Nottinghamshire, there is a monthly dole of bread to the villagers, but it happens that there is no "dole door" in the church, and on the Saturday before the dole Sunday loaves of bread are piled up inside the church, ready to be given away on the morrow. The leper windows or rather "slits" are of a very early date, and are more common in churches of the eleventh, twelfth and thirteenth centuries, than in those of later date. Their use was for lepers who were forbidden to mix with their fellow men, and were consequently unable to see anything of the worship excepting from outside the buildings. A "squint" is a narrow slit cut or built at an angle through the wall, large enough for one person at a time to look through and get a peep at the altar. They are sometimes found in out-of-the-way angles of the chancels, behind buttresses and sometimes in the plain surface of the walls, no particular position having been assigned to them. Leprosy was rampant in the eleventh century consequent upon the great consumption of pork, the disease gradually dying out as greater attention was given to diet and cooking, and as the practice brought over by the Normans of eating vegetables as an accompaniment of meat became general. "Squints" are sometimes cut in the side of the chancel arches to enable those sitting in the aisles to obtain a view of the altar; there is an example of this in the church at Hasely, Oxfordshire, where also "squints" are used for the admission of light to the rood-loft steps in the thickness of the wall.



West Tanfield (Confessional), Yorkshire.

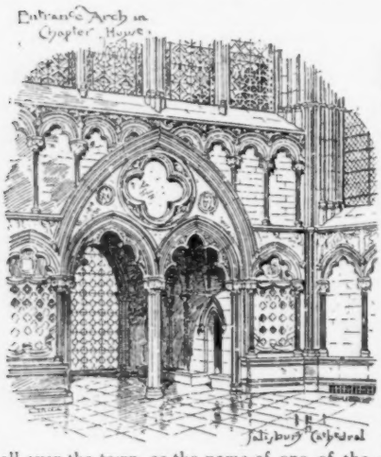
"Easter sepulchres" are to be found in many churches. These are carved representations of the Resurrection of Our Lord, treated in various ways. One in very perfect preservation is at Hawton Church, Nottinghamshire, which owes its present perfection to an accident: it was completely buried with plaster, by the parishioners to hide it from the rude soldiery of the Reformation, and has ever since for more than three hundred years been forgotten, until when the church was being restored it was accidentally discovered. It consists of a base three feet high, divided into four panels, in each of which is carved in bas-relief, the figure of a Roman soldier fully armed, sleeping as he sits on his heels, or otherwise crouches in a somewhat constrained position. Above this base is a recess of about eighteen inches deep, four feet high and five feet wide, in front of which in a line with the base is an arcade of three arches, the central one being three times the width of the other two. In the wall at the back immediately behind the narrow arch on the left-hand side is a low archway like a piscina, representing the entrance to the tomb. On the wall at the back of the other two arches is the representation, also in bas-relief, of the meeting of Our Lord and Mary in the Garden. Above all this is some rich and delicate carving, and still higher is a group of disciples "gazing up into heaven," which is represented by a foliated string-course, in the centre of which are to be seen the feet of the ascending Saviour as He passes out of sight. This particular "sepulchre" dates from 1420.

Niches and brackets for figures of the Virgin and of the patron saints of the churches are placed in every conceivable position, from a niche over the entrance doorway to brackets on either side of the altar at the east end. One of the nave pillars in Dorchester Church, Oxon., has a very heavy bracket richly decorated, originally supporting a figure of the Virgin and child. It is in an unusual position, being only four feet from the floor, and it may be said to have its origin in the arrangement so common on the Continent of Europe of placing figures of Saints half-way up the nave pillars.

[1] By R. W. Gambier-Bousfield, A.R.I.B.A., A.A.I.A. Continued from page 304, No. 496.

TAKING DOWN A CHIMNEY. — A mill-chimney in the United States was recently taken down in the following manner: The proximity of buildings limited it to falling in one direction. About eight feet from the ground a recess was cut across the side of the chimney, and heavy timber shores braced against the chimney. The chimney was cut away beneath the side supported by this timber. Holes were bored in the timber midway between the ends, and illuminating coal-oil poured into these holes until the timber was thoroughly impregnated with oil. It was then set on fire, and when too weak to support the load of half the chimney, it fell in the desired direction. — *Engineering.*

GOSSIP ABOUT SALISBURY.



IN a valley at the confluence of three small rivers, the Upper Avon, the Wily and the Bourne, surrounded by fertile meadows, and with a background of half-cultivated chalk downs, lies the old city of Salisbury. It is said that the reason for vacating Old Sarum was the want of water, and if this be true, certainly it accounts for the choice of the present site. Before drainage became the fashion, there were innumerable streams all over the town, as the name of one of the principal streets bears witness, the "Canal." Indeed, so watery was it that it was absurdly likened to Venice. There is an epitaph to Mr. Francis Hyde, who died while Secretary to the British Embassy at Venice, which illustrates this: —

> "Born in the English Venice, thou dost lie,
> Dear friend, in the Italian Salisbury."

Salisbury is a picturesque old town of red-bricked, gable-roofed houses, which, though fast disappearing, are being replaced by a similar style of architecture. The new bank in the market-place is a fine building, with barged walls and high, pitched roof. The Halle of John Halle (now a show-room of Mr. Watson's china-shop) is a banqueting-hall built in 1470 by J. Halle, a wool-stapler in the reigns of Henry VI and Edward IV. It has an open-timber roof, the compartments between being ornamented with fans of white plaster. At the south end is a large oak screen.

The George Inn has an old covered gallery round the inner court-yard, which is entered by an arch from the High Street. Here Pepys wrote in his diary "that he lay in a silk bed and very good diet," but he bitterly complained of the exorbitant charges: "7*s.* 6*d.* for bread and beer;" so "mad" was he thereat, that "he resolved to trouble the mistress about it and get something for the poor." ("*Pepys's Diary*," II, 237–238).

St. Nicholas Hospital, founded in 1227 by Ela, widow of William Longespée, Earl of Salisbury, has been restored by Mr. Butterfield, and is an example of pure Early English. St. Edmund's is an interesting church of the Perpendicular period, and has traces of fresco paintings. Some of these have unfortunately been repainted, with disastrous results. The crude ideas of fifteenth-century painters upon the "Last Judgment" are curious, when they are to be seen in their primitive condition, as in the Campo Santo at Pisa; but "restored" and made new and bright, they become simply ludicrous. Witness, here, the clean, pink bodies rising from green, grass-grown tombs.

Persons interested in archæology and prehistoric men, birds and beasts, should visit the Museum in St. Ann's Street, founded by the late William Blackmore, and arranged by the late Edward Stevens, both natives of Salisbury. It contains objects illustrative of the natural history of the neighborhood: archæological specimens, etc., found during excavations; fossils, arrow-heads, knives, etc.; also models of the lake-villages of Switzerland, implements in stone and bronze, and weapons, etc., used by modern savages. An important part of the collection was formed in various parts of America, including Peru, by Mr. Squier and Dr. Davis, and was purchased by Mr. Blackmore during one of his many visits to the United States. Americans will see their stars and stripes amongst the armorial bearings of the countries represented in the Museum, which ornament the walls beneath the mullions of the windows. Visitors who have not seen the collection of incised drawings or carvings in bas-relief upon bones in the museum at St. Germain-en-Laye, near Paris, would do well to study those on view here. They are from the bone caves at Le Moustier, and about Abbeville, France, and are as perfectly drawn as the best artists of the day could do them; yet nothing is known of these prehistoric sculptors and draughtsmen, and we are expected to believe that they were savages living in caves! Perhaps it is possible for a scientist to credit this; but can an artist, knowing as he does, that no extant savages have any idea of drawing? And yet these reindeer, these ibes, even the famous mammoth himself, are more perfectly formed than they would be by the average student of an art school!

The "Church House," near Crane Bridge, a building of the fifteenth century, is being admirably restored. Until lately it was used as a workhouse, but it belonged formerly to Mervin, Lord Audley, who suffered death on Tower Hill in 1631. The library has an open-timber roof and barged walls, with a gallery opening from a turreted staircase. Some stone fireplaces of the same period have been given by Lord Radnor and Miss Grove, which add much to the beauty of the rooms. It is altogether an excellent example of a house of the period.

But it is the cathedral which is the great object of interest in a visit to Salisbury. On entering the quiet and peaceful close by one of its old covered gateways, one gets a fine view of the church, surrounded by the smooth green turf, on which are some magnificent old elms. Perhaps the best point of view is the northeast corner. The exterior is one of the finest of the English cathedrals', and the spire is certainly the most graceful one in the world. The See of Sarum was founded A. D. 634 by a Genoese, but the seat thereof was then at Dorchester. It was divided and subdivided from time to time, until in 1075 it became settled at Old Sarum, St. Osmund, a nephew of the Conqueror, being its second bishop. He completed the first church which Herman had commenced, and caused the "*Use of Sarum*" to be compiled. He died in 1099 and in 1456 was canonized; his remains having been transported to the Lady Chapel of the new church in 1226. Bishop Roger, a Lord Chancellor, Treasurer and Chief Justice, was succeeded by Jocelin de Bohun, a member of the noble family which supported the Empress Matilda in her contests with King Stephen. This bishop also opposed Thomas-à-Becket, and adhered to the king's party (Henry II), having a great deal to do with the drawing up of the "Constitutions of Clarendon," for which the archbishop excommunicated him. The seventh bishop, Richard Poore, was the founder of the present church, and before his translation to the See of Durham, he saw the new cathedral sufficiently advanced to be consecrated; *i. e.*, the Lady Chapel, which was finished five years after the laying of the foundation stone, viz., in 1225. The name Poore, is by some persons supposed to be equivalent to "poor," but this must be an error, as the Bishop's brother Herbert is described as "*dives*," rich, and he himself gave an estate to his new cathedral. The name probably comes from the Norman equivalent of the Latin *puer*, a boy. *Puer Anglicus* was an old designation of the Prince of Wales, just as *Infante* is still used in Spain; hence *le poer* meant a younger son or thane, the latter being the title of the lesser nobility in Anglo-Saxon times. *Cild* in Anglo-Saxon had the same meaning, and thus we have, in Dorsetshire, Child-Okeford and Poor-Stock, places held originally by a "king's Thane," or one of the lesser nobility.

Tradition gives Elias of Durham as the name of the architect. He was a canon of the cathedral during Poore's time, and held a prebend, and the "*Martyrologie Book*" of Salisbury speaks of him as having been "director" of the new church for twenty-five years — this would probably mean "clerk-of-the-works" in modern language. That he was the builder of the original house in the close called "*Aula Plumbea*" or "*Leden-halle*" is certain from the "*Book of Evidences*" amongst the bishop's monuments: "*Scriptura de domibus de Leden-halle per Eliam de Derham sumptuose constructis.*" Moreover, this same Elias accompanied Poore to Durham, where the bishop, finding a Norman apsidal termination to the cathedral, substituted an Early English one called the "Chapel of the Nine Altars." The resemblance in style between this and the Lady Chapel of Salisbury is thought to be some proof that both may have been the work of the same architect.

One of the reasons for considering the exterior the finest of all the English cathedrals is its peculiar completeness. Few other churches are entirely of one period; but here the builders never seem to have changed the original design, as may be seen by the regularity of the lines of the masonry, the stones seeming to be of the same size, and to run in even bands all round the church; it is impossible to see where they left off. Another peculiarity is the double transept, the eastern one being smaller than the western. The tower and spire are supposed to have been built about 1290–1320, being of the best Decorated period; but whether the original architect meant to add a spire or not, is doubtful. That he intended the lower story of the tower to be open to the church is certain, as, above the arches upon which it rests, and now concealed by later groining, is an arcade which was formerly a series of detached Purbeck columns round the whole of the interior. Probably a lantern, as at Ely, was the original idea. The spire is four hundred feet high, being the loftiest in England. St. Paul's, London, is three hundred and sixty-five feet, while Amiens, France, is four hundred and twenty-two feet (it is a *flèche* rather than a spire) and Strasburg is four hundred and sixty-eight feet. Originally there was a bell-tower detached from the church, but this was destroyed by the vandal James Wyatt (1782–90), who was let loose upon the church to destroy and mutilate it to his ignorant heart's content.

The west front was probably the last part of the building completed, and is a mere mask, not being in any way a finish to the nave. It is a mass of niches with figures of saints, most of them new. There are three doorways, over the central one of which is an old group of the Blessed Virgin and child. A great many cavities for dedication-crosses remain on the external walls; these were filled with metal and anointed with chrism on the hallowing or consecration of the church. The north porch is exceedingly beautiful; it has a double arcade of trefoil arches supported by polished Purbeck marble shafts. The nave is eighty-four feet high, and eighty-two feet wide (Westminster Abbey is one hundred and three feet high and seventy-five feet wide, which accounts for the superior elegance of the proportions of that church above all others; York, on the other hand, is ninety-three feet high and one hundred and six feet wide). The nave is divided into ten bays, the shafts being a central stone column with clustered Purbeck marble ones round it. Above runs a

beautiful triforium, open to the roofing of the aisles, a succession of flat-pointed arches subdivided into four smaller ones, ornamented with trefoils and quatrefoils. The clerestory consists of triple lancet windows.

The fault of the church lies in its illumination, all the aisle windows being very large double lancets. Yet in this the old builders showed their wisdom, since, having to construct a church in a foggy, damp climate, they made the windows as large as possible, in order to get the greatest amount of sunlight. But in the old days they were doubtless filled with stained glass, and if this could be done now, and upon some system, with such glass, for instance, as is the glory of the Sainte Chapelle in Paris, the effect would be gorgeous. As it is, the windows which have been put in are not of the best character, and no harmony exists in the designs of the different ones. The church was restored some few years ago, and unfortunately the color which is supposed to reproduce the fragments of old painting remaining in places is very weak and *faded*. It is indeed remarkable that whereas a groin of old paint is *scarlet*, the modern imitations are *pink*, and so on with the other colors. The Sainte Chapelle has been more fortunate in its restorers; the colors there are bright enough to stand for years; whereas one or two decades will make those of Salisbury scarcely perceptible. Then again, the stone having been scraped and the Purbeck columns polished, the whole church has a new and clean, a black-and-white appearance, which rich-colored glass would tone down. While speaking of the windows, it may be well to point out the one in the south aisle of the choir, put up to the memory of Lady Radnor. It is of *grisaille*, with eight distinct figures in color, but a rich, golden hue pervades the whole, and the harmony is excellent. The designs of the figures, which are exceedingly graceful, are by Mr. Holliday, and the execution by Mr. Powell. Another window from drawings by Mr. Burne Jones, is less happy in color, and the design is confused. In the south transept is a window made up of old *grisaille*, and there are a few pieces of the thirteenth and fifteenth centuries in the great west window.

A curious feature of this cathedral is the stone bench which extends on each side of the nave, supposed to have been erected to strengthen the foundations, as all the pillars rest upon it. That the ground is or was not of the firmest character is proved by the sinking of the shafts under the tower, which causes the spire to be some twenty-two inches out of the perpendicular. Over the entrance to each of the transepts, also, extra arches were inserted in the fifteenth century, to strengthen the tower and roof. The pulpit and the chancel screen are new, the latter, with all the rest of the iron-work, in the worst possible taste. It is mean in design, and gilt and silvered, giving it a common and trumpery appearance; and the same must be said of the altar standards. A great deal of the old painting remains on the roof of the choir, probably dating from the thirteenth century, and it would seem, from the central subject being "Our Lord in Glory," that the altar must have been originally under this, on a line with the centre of the choir transepts, instead of in its present position farther east, and close to the entrance of the Lady Chapel; but on the other hand, it is known to have been in its present position in 1540. It is unfortunate that the restorers who were scandalized by the old position of the organ on the top of a heavy wooden screen should have placed the new one in so prominent a situation as to fill up an entire bay on each side, and project into the choir, thus completely spoiling the vista.

On the north side of the choir is the beautiful chantry of Bishop Audley, who died in 1524. It has a fan-vaulted roof and has been colored. On the opposite side is the Hungerford chantry, erected in 1429, and desecrated in 1778 by Lord Radnor, who removed it from its original position, and converted it into a pew, rarely used, one would suppose, for the occupants would have to sit up in high chairs (still there) behind an iron railing. This is by no means an uncommon instance of the use that tombs were put to in the last century. At Tong Church, near Shiffnal, in Shropshire, an entire chapel is occupied as a pew. It is separated from the church by an open arcade and doorway, and, to make it comfortable, the owners have placed a stove in it, which is poked and raked out during service!

The Lady Chapel is exceedingly beautiful, being composed of slender black marble columns supporting the groined roof, the largest of which only measure nine or ten inches in diameter, though they are thirty feet high. Under the windows is a series of niches, the canopies of which formed part of the Beauchamp Chapel, destroyed by Wyatt; as, indeed, did also the mouldings which go round the north and south sides of the chapel. On the north side of the altar is a recess in the wall, divided by a shelf into two parts, with the remains of hinges showing that there was formerly a door. Two similar niches in the same position are to be seen in the Morning Chapel, and no doubt they were credences or tabernacles for the reservation of the Blessed Sacrament.

The monuments were all more or less destroyed, or displaced by Wyatt, and the placing of one between each bay of the nave upon the stone bench is entirely his arrangement. Some are interesting, but there are none to be compared to those in Winchester Cathedral, though doubtless the Beauchamp chantry was as fine before it was demolished. Taking those in the nave in order, and beginning at the south side of the next door, No. 3 is a slab with the effigy of a bishop in full canonicals, and surrounded with a border of birds and foliage. It is supposed to have been brought from Old Sarum, and to have covered the tomb of Bishop Jocelin, although competent authorities cannot make up their minds whether this or the next are respectively that of Bishops Roger and Jocelin. The tomb of William Longespée (No 10), still retains a good deal of the old coloring. The effigy of the Knight is in alabaster, and rests upon a tomb of exquisite diaper-work painted in tempera — erroneously described in "*Murray's Handbook*" "as painted on linen." Longespée was a son of Henry II and Fair Rosamond. No. 11, that of Sir John Cheyney, is a beautiful tomb of the fourteenth century. Sir John was of extraordinary size and strength, as was proved when Wyatt removed the tomb; a thigh bone being found in it which measured twenty-one inches [? 31]. He was standard-bearer to Henry of Richmond, at the Battle of Bosworth, and was unhorsed by Richard III in the desperate final rush, when the King, killing Sir William Brandon, and aiming a savage blow at Richmond himself, was thrown from his horse and killed. No. 17, is that of William Longespée, the second Earl of Salisbury, and son of the former earl. He is cross-legged, and in chain armor, after the manner of a Crusader. He went twice to the Holy Land, in 1242 and in 1249, when he was joined by St. Louis of France. The next year he was killed by the Saracens, and buried at Acre. Beyond this tomb is the one of the so-called Boy-Bishop; but whether it represents a chorister who died "in office," or is simply a miniature effigy of a real prelate, is doubtful. It is by no means uncommon to find these diminutive effigies. One still exists at Winchester Cathedral of about the same date (Bishop Ethelmar, 1260); and others are to be seen at Abbey Dore Church (a bishop fourteen-and-a-half-inches long); at Horsted Keynes, Sussex (a cross-legged mail-clad knight); and at Haccombe, Devon (a civilian); and it is thought that they were used to cover the burial places of portions of the body, such as the heart. The custom of burying different parts of the body in different places was very prevalent in the Middle Ages. Blanche d'Artois, wife of Edmund, Earl of Lancaster, who died in 1302, and whose body was buried in Paris, and her heart in the church at Nogent l'Artault, is commemorated at St. Denis, near Paris, by a diminutive effigy. Many of these smaller statues now remaining, have their hands crossed over their breasts holding a heart, which may also be additional evidence to the supposition that it is the heart that these little statuettes commemorate. However, this is all guesswork, and the tomb may really represent one of the boy-bishops, though why in that case it should not have been life-size, is difficult to understand. Be this as it may, there is no doubt about the fact that every St. Nicholas Day (December 6), the choir boys elected one of their order to represent a bishop, hence the term *Episcopus Puerorum*. From the feast of St. Nicholas to that of the Holy Innocents (December 28), he bore the name of, and wore the vestments of a bishop; while the other acolytes played the part of prebendaries. On St. Nicholas day a grand procession took place. Entering the church by the great west door, and passing up the nave to the altar, the bishop took his seat and the mass began. It must have been a fascinating sight, these children clothed in diminutive vestments, mitred, and bearing the crozier, surrounded by canons and minor canons bearing lights and incense; and the idea seems to have sprung from the words, "out of the mouths of babes and sucklings hast Thou ordained strength" in the collect of the Feast of the Holy Innocents; for it is difficult to believe that it was a custom of the Primitive church, so entirely does it seem to be in accordance with the spirit of the Middle Ages. A full description of the ceremonies is to be found in the "*Processional of Salisbury Cathedral*," where also the service is printed and set to music. Of course it led to grievous abuses, processions and begging about the town after the church ceremonies, being the common practice; and in 1542 it was forbidden, and although partially revived during Mary's reign, it was finally abolished under Elizabeth. This strange custom was by no means confined to England. There are accounts of it being in vogue in many French towns. At Roye in 1527, at Amiens, at Toul in 1500, at Caen, earlier in 1256, at Aix it survived till 1543, while in Germany a similar custom seems to have prevailed. At Bayeux it was "*très solennelle*," and in the Inventory of the Treasury in 1476 are these items: —

"*2 mitres du petit Evèque;*
Le baton pectoral du petit Evèque;
Les mitaines du petit Evèque;
4 petites chapes de satin vermeil à l'usage des enfans de chœur à la fête des Innocens."

Some bas-reliefs by Flaxman in the northwestern transept, do not seem to bear evidence to the great reputation of the sculptor; they are stiff and graceless, and seem to be proof that a man may be a great artist in minute work, and utterly fail when he attempts the grand. In the north aisle of the choir is one of those figures of a skeleton, supposed to be the effigies of persons who tried to fast forty days in imitation of our Blessed Lord. This, of one Fox, is succeeded by that of Dr. Bennet, precentor of the cathedral from 1561–64, of whom a similar story is told.

The modern tomb of Bishop Hamilton by Sir G. Scott, is handsome in its way. But far more beautiful, and perhaps the most interesting in this church is that of Giles de Bridport, during whose prelacy the cathedral was finished. It consists of a canopy, supported by open arches with quatrefoils in the heads; underneath rests the effigy, at the head of which are small figures of angels censing. Each arch is sub-divided by a central single shaft, and springs from clustered detached shafts. A triangular hood-moulding with crockets and leaf finials projects above each side. The sculptures are remarkable, and are supposed to represent events in the bishop's life. Both sculptures and architecture resemble the Chapter House.

The cloisters are among the finest in England, being in thirteenth-century work, and equal to the Perpendicular ones at Gloucester. The windows are divided by arches sub-divided by a slender shaft, and have a six-foiled opening above. In the centre of the quadrangle of turf are two cedars; and all about are simple little square stones, with here and there a wreath or cross of flowers — sole records of the resting-place of those who die in the close. It is probable that the cloisters were built between 1260–84, and the Chapter House somewhat later, in the reign of Edward I; for in 1854, during the restorations, many coins of that reign were found amongst the foundations.

The Chapter House contains eight windows between an equal number of buttresses, and divided into four lights with quatrefoil tracery. Below the windows is an arcade in the spandrels of which is a series of sculptures in high relief, representing events in sacred history from the Creation to the Declaration of the Law by Moses; they have been entirely restored and colored. Here again is a resemblance between Salisbury and the Sainte Chapelle; but the sculptures in the latter have been only partially restored. The French architects often leave a portion of the old work as they find it, restoring the rest, which is an excellent plan as it enables the student to study old work. Another plan they carry out is to place the old work in a museum — in Paris at the Hotel Cluny — or in the adjoining garden, and replace it in the church by new. This was done at St. Germain des Prés, and is a far more sensible plan than leaving old work to be restored and colored. There is a great similarity between many details of Salisbury and the Sainte Chapelle, as for instance the tracery of the windows: in fact the two churches are of about the same date, Salisbury 1220–58, the Sainte Chapelle, 1245–57. Below the arcade runs a continuous stone seat. The central shaft is clustered, supporting a fine groined roof. The vestibule contains some un-restored sculptures, which fill the voussoirs of the arch of the doorway. They represent the virtues, trampling upon the vices. The figure in the niche over the entrance is probably that of the Blessed Virgin. Mr. Burges says of these figures: — "They are of the very highest class of art, and infinitely superior to any of the work in the Chapter House, the only defect being in the size of the heads. Probably this was intentional on the part of the artist. The intense life and movement of the figures are deserving of special study." The height of the building is fifty-two feet to the vaulting.

Passing out of the close, the visitor should notice the many charming houses round the cathedral. The Poultry Cross is quaint, but has been too much restored; it is fifteenth-century work, octagonal, open at its six sides, with a central shaft supporting a canopy and a finial; it is of the same date, but not so fine as the Chichester Market Cross.

S. Beale.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

A CHAPEL OF BORDEAUX CATHEDRAL, FRANCE.

THE typical arrangement of the eastern end of a French cathedral is made up of five chapels radiating from the central sanctuary at the end of the choir, a polygonal system of planning which brings out many beauties of Gothic composition never found in the more severe rectilinear methods of the English Gothic. Each chapel of the *chevet* is a kind of bay between the main buttresses of the choir vault. The drawing of a chapel of the *chevet* at Bordeaux is a fair example of this feature of the middle-pointed or geometric age (thirteenth century).

The cathedral itself, dedicated to Saint André, is a fine structure, with a great nave without aisles, one of those interiors which in their adaptability to modern congregations reproach the timid modern designers of three-aisled churches. Externally the most striking features are two towers with spires to the north transept (very effective, although in an unusual position) two others, without spires, to the south transept, and (after the fine *chevet*) a well-proportioned tower, with a modern spire, standing detached at the east end. All have been well restored, as indeed have nearly all the old French churches. It is hard to say whether they look better for it, the partial decay is so picturesque; but it is a necessity if the old beauties are to be preserved. There is also some very fine stained glass at Bordeaux.

The sketch of a door is from Limoges Cathedral, taken as a specimen of the style. The edifice is a noble work of the thirteenth century, not of any great size, and having only two bays of the nave originally built. But at the time of the writer's visit the completion was in progress, and doubtless by this date is accomplished. All the work is in a hard granite, and the fair amount of elaboration is therefore an expensive work.

R. W. Gibson.

COMPETITIVE DESIGN FOR A CHEAP STABLE SUBMITTED BY "*At the Eleventh Hour.*"

Silas O. Smith, of South Orange, N. J., says he will build such a stable as is here presented, with the man's room cased up in wide pine boards; with plain staircase, and turned chestnut posts to stalls; stall-partitions, 2″ matched spruce; iron gutter leading to manure-yard, iron mangers; stalls lined with pine boards 5′ high; harness-room cased in pine, with hooks, etc.; stable floor of 2″ spruce, carriage-room floor, ditto; carriage-room entirely unfinished, no side casing or ceiling; second story floor of matched pine boards; central matched-pine partition separating stable from carriage-room, and hay-loft from stable-loft, grain-bins, grain-chutes, mixing-box, etc.; on the exterior, cover roof and walls with shingles (rough sawed pine) over 1″ x 2″ strips nailed to studs and rafters; battens and 1″ x 10″ vertical boarding below sills; cornices, mouldings, finials, etc., as per detail; the timbers to be 3″ x 12″ joists, 4″ x 4″ posts, 2″ x 4″ studs, 2″ x 6″ rafters, all set 16″ on centres, and the exterior wood-work to have two coats of Cabot's creosote stains; all complete as above, and in many other respects not herein described specially, but such as are usual for a building of this kind, for the sum of fourteen hundred dollars, and be glad to get the job.

In regard to the mason-work, "*At the Eleventh Hour*" has in mind a client with plenty of field stone on his place, so that the stone chimney would not be such an unwarrantable affair as might be supposed at first glance. Such a chimney has been laid up for $75. The trench wall for foundations would also not cost much, say, $80, but piers could be used at a less cost. The roadway in front is not included. Total cost, therefore, is reckoned at $1,555.

"*At the Eleventh Hour's*" client likes a harness-room separate from stable but easily contiguous to carriage-house. He sometimes takes a cigar in this cozy little haven, and hence the open fire. The man has access to stable from staircase without disturbing the big doors, and is able in his room to be aware of any disturbances among his charges below. The rear door allows access to carriage-room from either side, and enables vehicles to drive right in under cover at once; for even though a carriage and horses (24 feet over all) were to drive in, the rear would be covered by the hood over front door.

VIEWS IN THE LIBRARY OF GEORGE E. LEIGHTON, ESQ., ST. LOUIS, MO. MR. HENRY G. ISAACS, ARCHITECT, ST. LOUIS, MO.

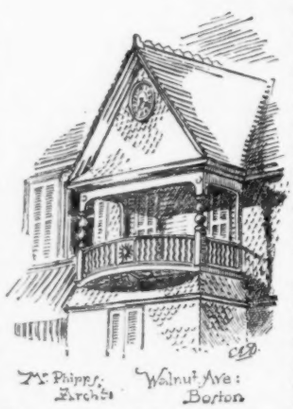
GABLES AND GABLE-ENDS IN AND ABOUT BOSTON, MASS.

OFFICES OF THE STANDARD OIL COMPANY, PITTSBURGH, PA. MR. W. S. FRASER, ARCHITECT, PITTSBURGH, PA.

COMPETITIVE DESIGN FOR A CHEAP STABLE SUBMITTED BY "*Ad rem.*"

A contractor of Newark, N. J., places the cost of this building at $1,490.88.

COMPETITION FOR A DESIGN FOR A MEMORIAL TO GENERAL GRANT.



THE feeling that prompted us to suggest a competition for a design for a memorial to General Grant was that here was an opportunity which many architects and sculptors would be glad to seize as a means of showing a generous, public-spirited willingness to give expression to the general desire to commemorate the Nation's regard for one of its greatest citizens.

We suggested, not a national monument, but one which might be erected by the citizens of a large city, as it seemed to us that more effect on the monumental art of the time could be effected through several praiseworthy monuments set up in different parts of the country than by the admiration which a single national monument would excite, however grand it might be.

It does not seem as if it should be necessary to offer any prizes for such designs, which might well be offered gratuitously by their authors as a tribute to the dead, an offering to the art of the country, a token to the thoughtless that the designing of such structures demands for its satisfactory fulfilment the training of those years of study and observation which the practical man of the day scoffs at as wasted time.

Still, as prizes are customary, we offer three equal prizes of $50.00 each to the best three designs. We name three prizes on the supposition that three classes of design will be submitted, the essentially architectural, the essentially sculptural, and the third, where the attributes of architecture and sculpture are combined without either greatly preponderating over the other.

In order that no one, the busiest, the idlest, the most indifferent, or he who "never goes into a competition," might find excuse for withholding his offering in the stringency of the conditions, we suggested only "preliminary sketches," and we intend that each one shall construe the phrase according to his fancy.

The only requirements are: A design for a memorial to General Grant to be erected by a large town.

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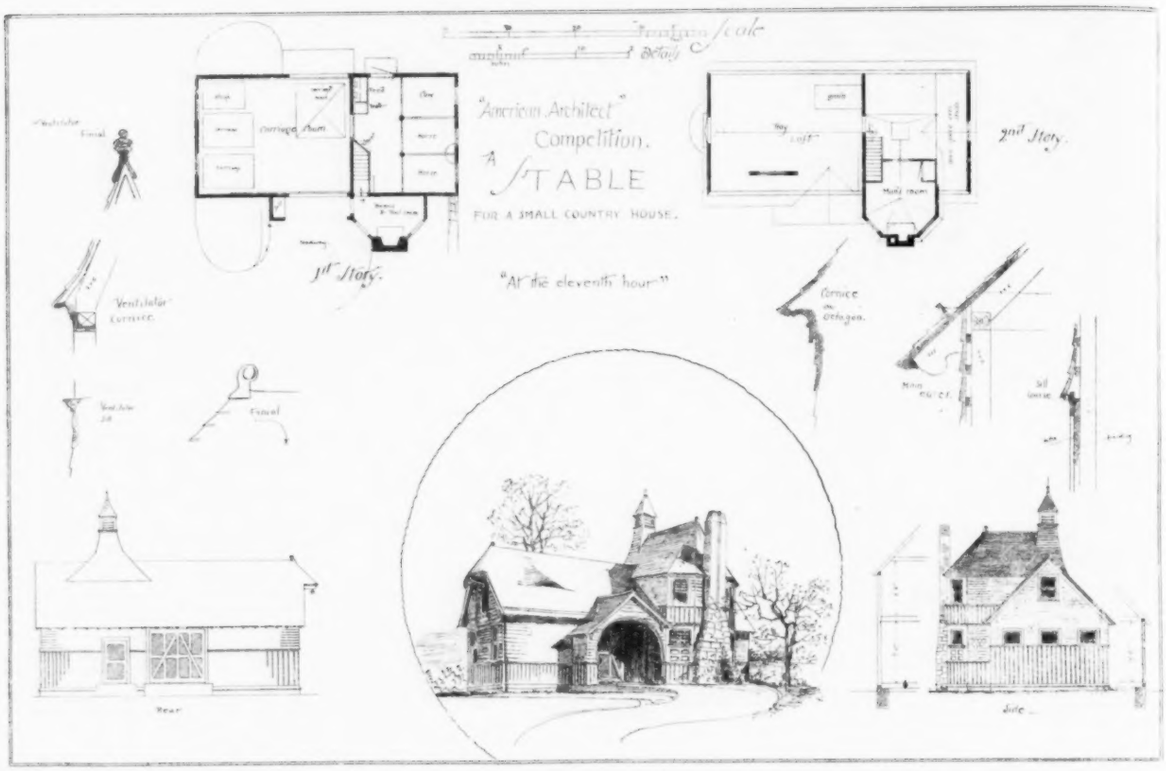

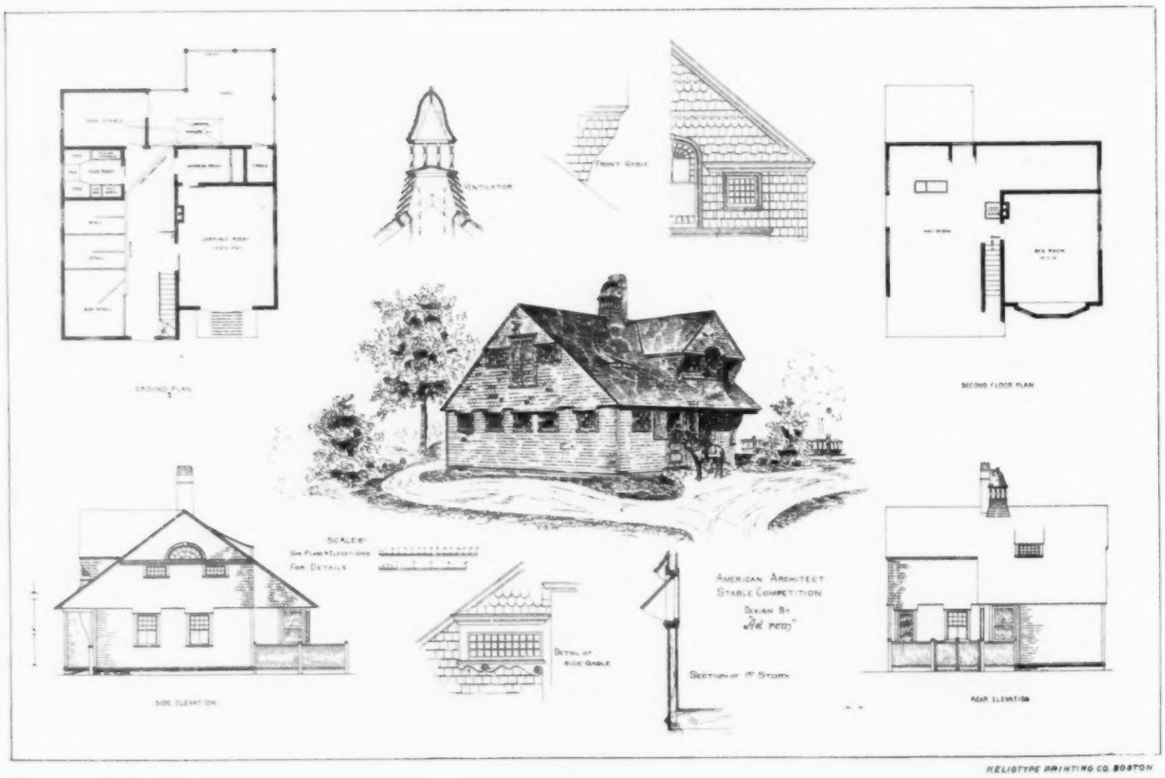

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Sketches in & around Boston, Mass.

"Features" Gables and Gable-ends.

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Office Building
for
Standard Oil Co.
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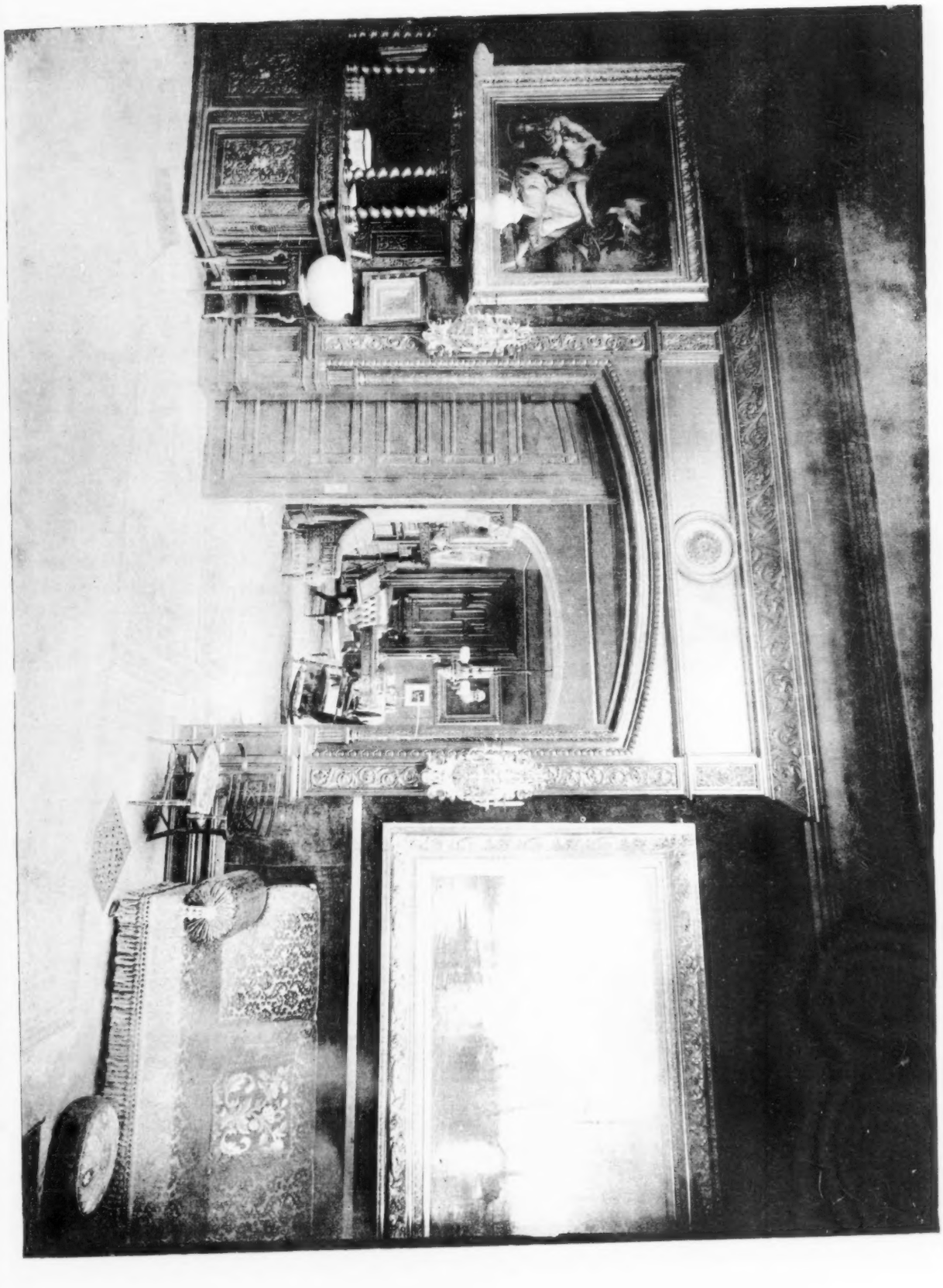

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Cathedral: Ely

Door to So Transept

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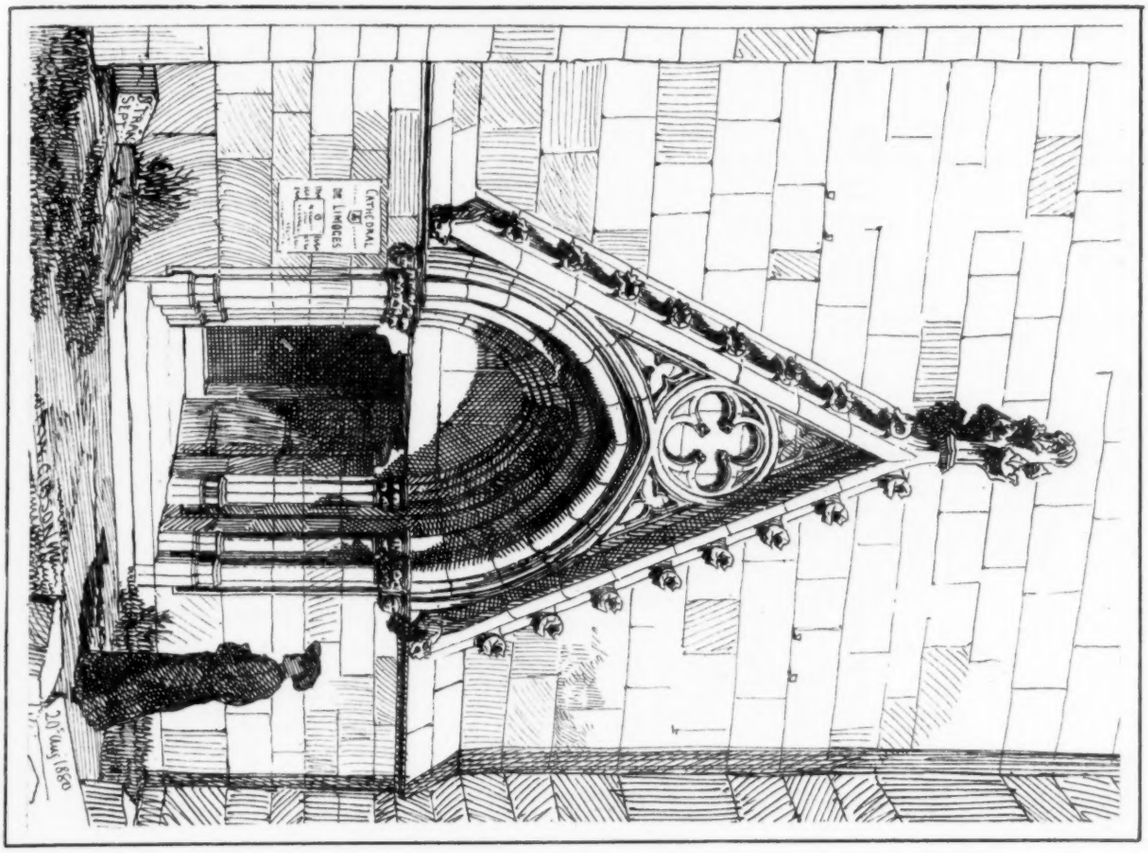
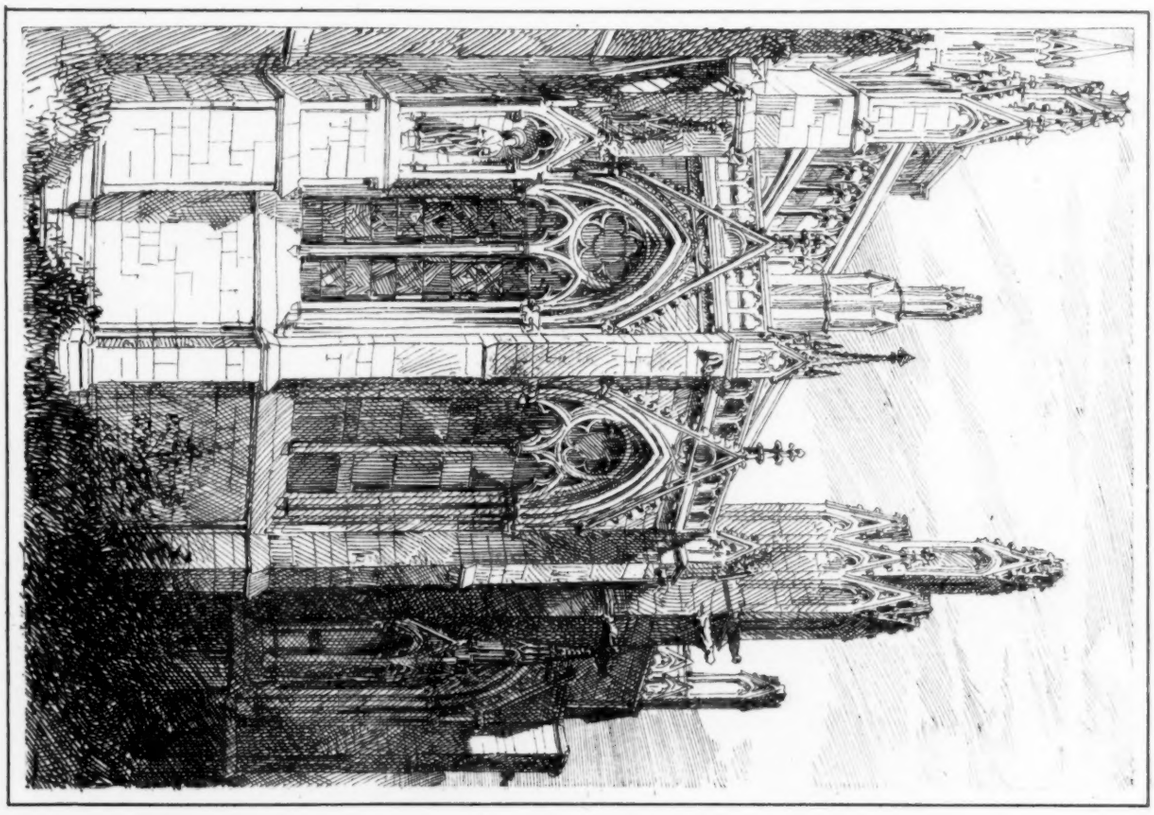


Cathedral, Limoges:
Door to Sa Transept



Cathedral Bordeaux. Part of East End.

The cost not to exceed $100,000.

The drawings in pen or pencil — no brushwork or color — to be of such size or at such scale as suits the convenience of the designer; but the scale must be graphically indicated on the drawing.

A brief memorandum of material and probable cost must be placed *on the drawing itself*. Each design must be represented by a perspective (or elevation) with plan and, if necessary, section at a less scale.

Each design must be signed with a motto and the author's name forwarded under seal at the same time. In case of publication the author's name will be announced — unless request is made to the contrary.

The award will be made by a jury of architects and sculptors.

Drawings must be received at the office of the *American Architect* on or before Saturday, September 19, next.

FORTUNE IN ARCHITECTURE.

ABOUT this time of year there is always in England a sort of glorification of youth and strength. From the competition for places in a school up to an inter-university shooting match we see efforts to bring forward the fittest. It is not merely a struggle of individuals, but of systems, and when there are so many concerned in the victories we are not to be surprised at the general prevalence of the belief that the trials of to-day are an augury of what is to happen. People have a kind of satisfaction when they learn that a new judge or bishop did good service in a cricket or rowing match. Some fruits ripen slowly, but they are exceptions, and we wish our prominent characters in Parliament and the professions to have held corresponding positions in school and college. The story is well known of the readiness with which Macaulay in the Athenæum Club seized an opportunity of narrating the histories of all the senior wranglers from the beginning of the century. It was a feat of memory, but it was also evidence that the young men who gained that position did not exhaust themselves by their exertions, and drop into obscurity. Early success is an indication very often of power that will endure for life.

We are often surprised that when careers are sought for the young folks who are supposed to possess such marvellous capacities, the profession of architecture is not more often selected. It may not be the most honored or the most profitable, but undoubtedly it is the profession beyond all others in which success awaits the young practitioner. It was an old saying that fortune favors the bold, but in architecture bold and young are synonymous. If we look for illustration to the Royal Academy, it will be found that all the architect academicians had won a high position in their profession at a much earlier age than any of the painter academicians, with the exception of Sir J. E. Millais.

It is hardly wise in considering a subject of this kind to allude to living artists, and, if we mentioned their names, it was only to show that our assertion is no less applicable at the present time, and can be tested in Burlington House. Let us take, therefore, the biographies of four of the most eminent among modern English architects, men whose memories still, and we hope may long survive among us. It will be evident that we are about to write of George Edmund Street, William Burges, Sir Gilbert Scott and Sir Digby Wyatt. It will be found that the four attained prominence either before they reached early manhood, or soon afterwards. Mr. Street was an improver in Scott's office when he was twenty. His share in the preparation of the competition drawings for the Hamburg Church brought him to the fore in Spring Gardens. Three or four years afterwards we find him established in practice on his own account, and in his twenty-fourth year he was an exhibitor at the Academy. Before he was thirty he was a man of mark in the Ecclesiological Society, and that position was gained by his works as much as by his essays and speeches. Mr. Street was not only a genius, but his whole heart was in his work, and he sought no other relaxation. Any man with so much energy must push his way to eminence. In his case, it would perhaps be more true to say burn his way, for he seemed on fire with energy.

Scott was of a less intense disposition, and he was not so fortunate in being placed early on the right track for success. His experience in a city office was enough to make a youth with artistic sentiment rather disgusted with architecture, and when he opened a small office in Carlton Chambers, the work that came to him was, he acknowledged, more mean than that of his days of pupilage. His father died. It was necessary that he should forthwith obtain commissions of some kind, and a few for workhouses appeared to be nearest his reach. Scott made a personal canvass of every guardian, and succeeded in being appointed architect for four unions. He regarded the profession as no more than a laborious means of making a livelihood, and was content when he secured an humble class of work. His churches came under that class. Chance threw an article by Pugin in his way, and, after reading it, as he said himself, modernism passed away from his mind, and all his aspirations became mediæval. Scott was twenty-nine or thirty before this transformation was accomplished, and therefore he may be said to have started rather late in the race. But the new spirit enabled him to overcome opposition, and when he was thirty-three the Hamburg competition brought him a prestige which was sufficient to gain him estimation from the clergy. Scott's case is therefore peculiar. His ambition at first was to secure commonplace work, and in that he succeeded while he was a very young man. But as soon as something more worthy was presented to his mind, he was no less fortunate in attaining it within a few years after he had made the effort. He may accordingly be cited as an example to show that when Fortune has resolved to be kind to an architect, she is expeditious in bestowing her favors.

William Burges can hardly be taken as a type of the successful architect in the common acceptation of the word, for if commissions were proportioned to his genius he must have been the busiest architect of his time. His notion of what was meant by education for practice was very different from Scott's or Street's, and before he opened an office he had gone through a long *Wanderjahr* and measured much of the best mediæval work on the Continent. But the remarkable fact is that in his first competition, *i. e.*, the Lille Cathedral, Burges, with all Europe against him, was successful, and in a year or so afterwards he gained the prize at Constantinople. It was quickly followed by the commission for the Cork Cathedral, and then if failures in competitions might be considered tests Fortune appeared to have deserted him. His works at Cardiff and Studley Royal need not be taken into account, for as they were to be unique in character, they must have been entrusted to him. In his case we see the promise of a great success given rather early, and if a longer life had been granted to him that promise was likely to have been realized beyond his expectations. He was justified by his early experience in waiting patiently for a return of his good luck.

In many ways there was a resemblance between Sir Digby Wyatt and Burges: both never ceased to be students, and the gaining of money was not the first consideration with either of them. It is remarkable that although Wyatt tempted people to think of him as an enthusiast for *bric-à-brac* rather than a practical architect, he gained a fair share of patronage, and, moreover, it came to him early. His duties in connection with exhibitions and Government offices absorbed much of his time, and it may have been supposed that he had no leisure to bestow on ordinary clients, still his list of executed works is satisfactory, although it does not correspond with his great ability.

If the practice of Sir Digby Wyatt is compared with that of his associate, Owen Jones, they may help to suggest the mystery which apparently is found in professional life. Jones's position as an architect deserved to be earlier recognized than Wyatt's. In 1851, when it was supposed that a new era was about to open making a new style indispensable, Owen Jones might seem to be the master of the situation, the man for the hour. Classic and Christian architecture he proclaimed were dead and gone. The new wants, the new materials, the new sentiments, the new science, could only be expressed in a style that had been derived from the Alhambra. The public admired the charming reproduction that was to be seen at Sydenham, but they were not convinced that stucco so arranged made better residences then when applied flatly as in their houses. One of the cleverest men of the age was, therefore, compelled to live in the expectation that geometric principles must prevail at last, and meanwhile had to gain a subsistence by designing playing-cards and other things of paper. The public were as far from believing in his constructive skill at the close of his career as at the beginning of it. Owen Jones's case is as representative as could be desired. He had spared no pains by study and travel to make himself a master in the profession; he had given proofs of original skill and of his readiness to abandon the beaten tracks; but the English people chose to esteem him as a producer of colored plates, a reviver of the old art of illumination, and, according to their wont, they adhered to that opinion. His discourses on "the present necessity of an architectural education on the part of the public" were the voice of one crying in the wilderness and unheeded.

There were architects who envied Wyatt and Jones when they thought of the possibilities of big commissions to which every *attaché* of the new Art Department might aspire. The lucky man was not, however, a civilian. For a time Captain Fowke appeared to carry everything before him, and, if he condescended to seek for work of an ecclesiastical and unofficial kind, it is not unreasonable to assume that he must have been no less omnipotent. But all his victories

were gained in the short term of ten years, and when he died this child of Fortune was forty-two. How many among us have failed to attract one good commission from the blind goddess at that age?

If we go back from our own times to one that is earlier a like phenomenon is before us. Take Sir Charles Barry, for example. He was among those who believed in the advantages of foreign travel, and did not seek for practice until he was twenty-seven. But then the prizes came quickly to him, and in little over a dozen years he possessed the greatest that ever fell to an architect in this country. Pugin, who was permitted to share in that prize, was another example of early success. In our matter-of-fact days it hardly seems possible that so many events on sea and land could be crowded into forty years. But even more remarkable is the story of Harvey Lonsdale Elmes, who in his twenty-third year was selected to be the architect of St. George's Hall. That it was no transient gleam of prosperity is seen by the number of the commissions which were offered to him during his brief existence.

It would possibly become wearisome if we followed the history of fortunate architects much farther. We may say, however, that what is seen to-day is but a repetition of what happened a century ago, and even earlier. The men who have a claim to be called successful will be found almost invariably to have undergone few tests of their patience, and it might almost be laid down as a law that, unless an architect finds commissions are coming easily to him before he is forty, he may abandon all hope of wealth or eminence. Few men have had a more toilsome uphill route than Sir John Soane, the bricklayer's son, and whose very name was borrowed; but at that age he was possessed of his Governmental and bank appointments, and the remainder of his way was easy.

It is a common expedient in fiction to show the triumph of the old over the young. Everyone who reads novels or has seen many plays can recall scenes of that kind. In one the old broken-down jockey jumps on a horse and wins the race from all conspirators; in another the old cudgel-player ascends the platform, and by skill and dexterity breaks the head of the giant; in a third the old prompter or supernumerary puts on the garb of Romeo and insures the success of the Juliet of the night; in a fourth a venerable gentleman passes his rapier through the body of the notorious duellist, who had just slain his son and grandson. Scenes of the kind may not be found in the works of the great masters, and Shakespeare, although friendly towards old age, has nothing of the kind. Othello felt there was some excuse for wronging him because he was "declined into the vale of years," and the "first old men" in the great dramas, although they may show great vigor occasionally, do not carry everything before them.

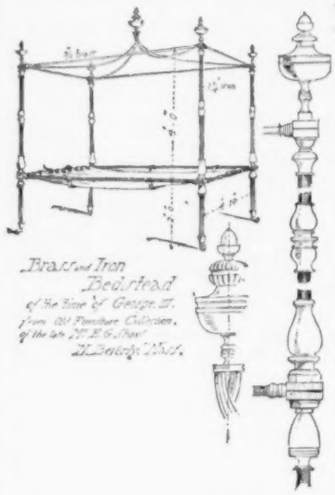
The experience of architectural practice is more corroborative of the Shakespearian than of the modern fictionist's practice. In all the competitions which have disturbed the world of late years, how many instances can be cited in which the prize was borne off by the seniors of the profession? There was one somewhere in Scotland; but, as well as we recollect, nearly all the competitors were first put out of court for non-compliance with the conditions. Judging by the history of competitions, it may be assumed that the prize-winner will be among the younger men.

It might be supposed that, with work like architecture, much experience is necessary, which is only to be acquired by the toil of many years. But the length of time has not been defined, and as long as men have been building they have not been afraid to entrust the responsibility for the works to the hands of youth. England is not alone in that respect. The practice is so ancient that the world has come to act upon it almost instinctively. An architect who is advancing towards middle age is expected to refer to many buildings of his own, and, should he be unable, his incompetency is not ascribed to fortune. In no profession is the maxim of nothing succeeding so well as success, more applicable than in architecture.

It will be asked what is the conclusion that is to be drawn from all this? The reply, we fear, must be considered harsh and painful. Believing in the doctrine that history is but philosophy in practice, and that its use is to afford us examples, we maintain that every architect, if he will only be guided by the past, can give a good guess as to his chance of future success. A time must be allowed for training, and for making one's name known. But before he reaches thirty a man who expects to be prosperous should have convincing testimony that his circle of clients is gradually increasing. If he has not had dealings with builders on his own account by that time, it will be well to forbear raising Châteaux en Espagne. The ten years that follow offer a crucial test. It is possible to hear of men who have had a good practice and lost it before they were forty, but, unless we are mistaken, it would be difficult to bring forward cases in which prosperity dates from that age. Chances are always turning up to surprise the world, but there are fewer of them in architecture than in the sister profession.

The effect of thoughts like those we suggest is likely to make people desponding. An architect who has a little of the stoic will be able to bear his lot amidst greater discouragements, and we know of many who continue to find a pleasure in the study of the art, although they are no longer sanguine that it will bring them any other reward. There are others who believe that the profession affords them opportunity for duty, and are satisfied. Besides, it is possible to lower one's expectations, and the student who expected nothing less than to be a Royal Academician may eventually be happy and contented when he finds that after years of canvassing he has succeeded in gaining one of the least profitable district surveyorships. Too many, however, continue to indulge in visions of artistic success, when, on reflection, they would see how illusory is the contingency. It has been said that "where no hope is, life's a warning, that only serves to make us grieve," but the question that should be asked by a great many is whether that hope might not be found with more confidence in some other pursuit?— *The Architect.*

ECONOMICAL AND FIRE-PROOF PLASTERING.



TO quote from "*Notes on Building Construction*," —"Plastering consists of applying different compositions, resembling mortar, to walls and ceilings in thin layers, so as to form smooth surfaces for the sake of appearance and cleanliness." This would be rather too brief a description with which to sum up the plasterer's trade, but it is sufficient for our purpose, and may stand as a preface to the paper we are writing; not so much with the object of describing the different materials and process of plastering now in use as to introduce to architects, builders, plasterers and others interested in building operations a new material, "Robinson's cement," recently invented, patented, and brought upon the market by Messrs. Joseph Robinson & Co., of the Knothill Cement and Plaster Works, near Carlisle, Eng. This cement will, we feel sure, be a welcome addition, not only to the plasterer, but to his employers. It is so good, so true and uniform in its manufacture, so economical and efficient in its working, and may be used for such a variety of purposes, that we believe it only requires to be sufficiently known to come into very general operation. We are convinced, after a long series of experiments and tests, of its great utility and efficiency as a substitute for any of the cements now in use, and from its cheapness, it is likely, when known, to very generally take the place of the present mode of plastering, entirely altering for the better the character of the work about our buildings in this very important respect.

So many improvements have been made in building materials and appliances of recent years, the artistic knowledge and requirements of the present time have so much increased on the part of architects, builders and their clients, that to be contented any longer with the plastering as it is at present done in the general way is hardly possible. It is not only tedious and clumsy in its preparation and application, but often imperfect in its result. The plasterer's pit taking up so much room about a building, and for such a length of time, for the proper slaking of the lime, is a positive nuisance, and a change in this direction is not only desirable but requisite, particularly where, as in towns, the space around building operations is limited, and in these days of rapid progress expedition in carrying out the works is so essential. These considerations, amongst others, have led Messrs. Robinson & Co. (or rather the head of the firm) to devote much time and attention to the invention of a cement that should obviate all this, by being equal in all respects to the Keene's, Parian, or other cements now used (but in limited quantities, and in the best class of work only, to which they are confined by reason of their cost), and at the same time so much cheaper that it might be introduced and used not only as they are, but as a substitute for the ordinary plastering, consisting of lime, sand and hair that we have hitherto been compelled to put up with. This result they now claim to have obtained by means of their new invention, and they reasonably hope that their cement may be given a fair trial, feeling assured that it will give every satisfaction, either when used in lieu of Keene's or Parian, or as a substitute for ordinary plastering.

Before more fully describing "Robinson's cement," it may be as well briefly to glance at the ordinary methods of plastering in general use, as it will enable us to make comparisons that may assist us in arriving at a fair decision upon this new material. In the ordinary methods of plastering familiar to most of us, the materials used are lime, hair and sand mixed together, and laid on in successive coats differing from one another in their preparation in accordance with the character of the work. Pure, or fat limes, are generally used for the sake of economy and safety, hydraulic limes requiring especial attention to prevent them from blowing. The lime should be most thoroughly slaked, or it will throw out blisters after being spread; for this reason the "stuff" is made long before it is required, and left for weeks to cool, *i.e.*, to become thoroughly slaked. The different preparations made in this way are the "coarse stuff," "fine stuff," and "plasterer's putty." "Coarse stuff" consists of one or one-and-a-half parts of sand to one of slaked lime; the sand is heaped

round in a circle, and the lime, previously mixed with water to a creamy consistency, is poured into the middle, hair is then added and well worked in to make the coarse stuff hang together, and the mixture is left several weeks to cool. "Fine stuff" is pure lime slaked to a paste with a small quantity of water, afterwards more water is added till it is of the consistence of cream, it is then allowed to settle and the water run off, that in the mass allowed to evaporate until the whole has become thick enough for use. "Plasterer's putty" is similar to "fine stuff" only prepared more carefully and run through a sieve. Taking the ordinary three-coat work, usually specified as "plaster, float and set," as an example. The first coat or "pricking-up" for ceilings or partitions consists of a layer of the "coarse stuff" spread over the laths, stiff enough to hold together, but sufficiently soft to pass between the laths and form a key; it is then scored over with the points of laths to form a key for the second coat or floating, which is applied when the pricking-up is sufficiently dry, and consists of "fine stuff" with the addition of a little hair, and is laid on with floats, worked upon screeds of plaster to ensure the surface being true; this is then gone over with a hand-float, any defects made good, and allowed to become perfectly dry. Then comes the third or setting coat. If the surface is to be papered it should be set with "fine stuff," and if whitened, with "putty" and washed, and if painted it should be finished "trowelled stucco," composed of two-thirds "fine stuff" without hair and one-third fine clean sand. If it is required to set very quickly, especially in damp weather, one-sixth to one-third plaster-of-Paris is added to the "stuff," and is then termed "gauged work;" it can only be mixed in small quantities, and great care must be observed that the other coats are perfectly dry, or the shrinkage being unequal, the last coat will be full of cracks.

Rendering is the term when the plastering is applied to walls; it is done in the same way as before described, but not so much hair is required in the "coarse stuff" as when used on laths. With the results, as thus worked out, we are all pretty well acquainted, but are not all equally satisfied. It has hitherto, for the want of a better, and not much more costly, material, been considered sufficiently good in the ordinary way to meet our requirements; but how often have we found by pricking the surface that the under coats run out like dust, indicating their soft and unsound quality. Then the blistering that often takes place over the surface, although so much time and care has been spent in the endeavor to slake every particle of lime, and again there is the cracked surface too often seen, rendering it necessary to apply some other material, such as paper to hide its defects. We submit that this is no longer sufficiently good, when the other fittings and finishings of our dwellings are so much improved in design, material and workmanship, if the desired end can be obtained at a trifling additional cost over ordinary plastering, as we believe it may be by using "Robinson's cement." This can be applied as Keene's or Parian now are, giving equally good, if not even better, results, and by reason of its cheapness may be substituted for general plastering, making good work in this respect the rule, instead of the exception, as at present. The additional cost in the material itself we think likely to be pretty well counterbalanced by the saving in space, time, and labor in working "Robinson's cement."

The plasterers' pit, and the time occupied in slaking the lime and waiting for the drying of one coat before another can be applied, will be no longer required, the carrying of the "stuff" from where it is prepared to the spot where it is wanted would be obviated, the cement being mixed where used with the requisite quantity of sand applied at once in one coat, and finished off as desired there and then, forming one homogeneous body, without any delay arising from the dampness of the weather or any other cause. Messrs. Joseph Robinson & Co., the patentees and manufacturers of this new cement, have been established since the year 1828. Their principal plaster and cement works are situated at Knothill, near Carlisle, where they have immense deposits of the purest alabaster. They have also extensive quarries in Westmoreland and in Staffordshire. Their Knothill works are directly connected with the Midland Railway system, the Midland Company having built the Cotehill Station specially for their extensive traffic and laid down sidings in connection with the works. The quarries situated in Inglewood Forest, from which they obtain their best alabaster, are practically inexhaustible, and are in first-rate working order. The uncovering, though considerable, requires no mining, the average depth of the face of the alabaster when uncovered being from twenty to thirty feet. Very large quantities of the alabaster are now bared, ready for use, the principle here being to keep well ahead in this respect in case of any unusual demand. The alabaster in these quarries in its original state is almost pure white, and as compared with alabaster generally, it is peculiarly hard, which is a great point in its favor, for the harder the nature of the raw material, the better the quality of the cement and its strength in setting after manufacture. Coal is cheap in the neighborhood, and the direct communication with the Midland Railway simplifies the getting it and sending away of manufactured articles. Messrs. Robinson & Co. make their plasters and cements where the raw material is produced, thus reducing their working expenses to a minimum, and enabling them to compete favorably with any other manufacturers, equally well placed. Hitherto for many years they have confined their attention principally to the manufacture of plaster-of-Paris, in its various forms; but having now perfected a cement so likely to come into extensive use, they are making every preparation needful to insure their meeting a large demand by erecting the additional necessary machinery. The manufacture of this new cement is simple, uniform and expeditious in the extreme, compared with that of other cements of similar character, which are not only complicated, but so slow and tedious that a long time is required in their manufacture. As an example of the expedition with which "Robinson's" can be manufactured, we may mention, that by way of a trial they have on receiving an order by the morning's post taken the alabaster out of the quarries, converted it into cement, and sent it off by rail the same afternoon. This means, of course, a great saving in the cost of manufacture, and enables them to offer their cement at a price which, together with its very greatly increased power of carrying sand, makes it possible of introduction for general plastering work. In perfecting this cement many experiments have been tried, and the results very carefully tested. These tests have been in operation over several of the winter months, and are most satisfactory. A short description of some of these tests may be useful.

TESTS.

A bay of a brick wall, a yard wide by two yards high, was covered with the ordinary three coats "render, float, and set" work for the sake of comparison; next to this and subject to exactly the same influences, and in similar sized pieces, were some five or six slabs of "Robinson's" cement work done by an ordinary plasterer as follows: —

1. The rendering coat, averaging five-eighths of an inch thick, consisted of two parts sand to one of cement, set directly sufficiently hard to be finished with a rough surface of equal parts of sand and cement, and in the space of a few hours was particularly hard and strong, equal in this respect to Portland.

2. The second slab was in the proportion of three parts of sand to one of cement for the rendering coat, of the same thickness as before, and was finished directly with pure cement one-eighth of an inch thick. This in a few hours also set very hard, and its strength became very considerable.

3. The third slab had four parts of sand to one of cement for the rendering five-eighths of an inch thick, and finished with pure cement. This also set very hard and strong, worked easily, and stands admirably.

After an interval of several months there is no sign whatever of deterioration in any of these examples; but, on the contrary, they have hardened with time, which is a conclusive proof of the quality and strength of this cement.

4. Several other mixtures of the sand and cement were tried at the same time for rendering coats, five to one and even six to one. With this very large proportion of sand the result was considerably stronger than the ordinary rendering of lime, sand and hair; but for general work the proportion of "four of sand to one of cement is recommended." The quantity of sand this cement will carry is greatly in excess of other similar cements, and proves its natural strength and economy in use.

On laths for ceilings or partitions it was tried in the first instance pure, averaging three-quarters of an inch thick; including the key. There was very little waste on putting it up; it formed a good key to the laths, and in the space of a few hours set so strong that it became extremely difficult to break it away even with hard hammering.

5. It was next tried for similar work with two parts of sand to one of cement, with a very little hair added for the first or pricking-up coat, and then finished with pure cement one-eighth of an inch thick; this made excellent work, and in pricking-up there was little or no waste.

Its resistance to fire was also tried in several different ways. It stood the tests applied, and proved its excellent fire-proof qualities; for casing wood and iron work it will be found very valuable, and also for forming a fire-proof ceiling. For running cornices, skirtings, mouldings, angle beads, etc., it is particularly well adapted, and is very good and strong, the labor in working all these being similar, but somewhat less, than in other cements. The cement was also experimented upon for external work. A piece of outside wall was selected in a most exposed position, and rendered with two parts of sand to one of cement finished with two of cement to one of sand, the sand being worked up to form a rough surface. This was done in January last, and has had all kinds of weather upon it since. After five months there is no sign of any deterioration whatever; indeed, its exposure has hardened it, proving that it might be used for outside work, especially in timber framing. As an additional proof of the strength of this cement, compared with other cements, an inch square briquette, seven days old, bore a strain equal to three hundred and seventy pounds before breaking, and as three hundred and fifty pounds is considered a very good and sufficient test for a Portland cement briquette of the same size and age, this is highly satisfactory.

Its tensile strength being so considerable makes it very valuable for setting decorative tiles, glazed bricks or "gauged" brickwork, where putty is now used; and there is no fear of its salting or expanding. It has already been used with the most perfect results in one of the large public buildings in London, and is considered so satisfactory that the architects are about to use it on a much larger scale elsewhere. It has been carefully tested for painting in several ways by a well-known London decorator, and with entirely satisfactory results, showing that it can be applied and painted upon at once, as with Keene's or Parian, or it may be left to get dry, and

then painted, as within three weeks of being rendered it is thoroughly dry and ready for decoration, and will stand fine colors perfectly. With other cements, if left, the period that must elapse before they can be painted must be measured by months instead of weeks. In using it no notice need be taken of "the time of year or the state of the weather;" the plasterers can be put into a room with the requisite quantity of sand, and cement and work it straight away; there is no delay required for drying, for as fast as one coat is done, the finishing coat can be run and the whole completed. The treatment of the various cements at present in use varies very slightly; they are generally laid on in one thickness of from half to three-quarters of an inch, and of the proportion of one of cement to one or one-and-a-half of sand, the surface being finished with a thin coating of neat cement. The ground-work is often done in Portland finished with Parian or Keene's; this, however, is rather doubtful policy, for besides bringing an additional material on to the works, it often (unless the Portland cement is most thoroughly dry, which of course takes time), sets up a chemical action detrimental to the finished face. Portland need never be resorted to with "Robinson's," which is sufficiently strong to carry easily four parts of sand and one of cement, making excellent work with that large quantity of sand, and being very economical in use on that account. Like some other cements, it can be brought up to a beautiful polished surface if required.

Hitherto cements of this description have been used for plastering in first-class work only, their cost being against their general adoption, and we have had to be content with the ordinary style of plastering for large surfaces. However, we now hope to arrive at a better state of things, rendered possible by the introduction of "Robinson's cement," which, whilst comparing in every way equally with any of the others, can be manufactured and procured at so much less cost, bringing it within the reach of all, for general as well as special purposes. Plasterers who have used it report very favorably upon it, and that it works easily, very smoothly and well; it does not discolor their tools, nor has it any other objectionable qualities. As its simplicity and cleanliness in working cannot be too strongly insisted upon, and its strength and durability are proved beyond a doubt, we are convinced that it only requires to be tried to establish its own claim to the consideration of architects, builders, plasterers and their clients. It is needless here to specify all its uses. For private dwellings, public buildings, hospitals, schools, workhouses and infirmaries it is especially well adapted, as its antiseptic qualities are a great advantage and make it practically impervious to absorption and infection. It possesses the additional advantage of being as easily and thoroughly washed as an ordinary slab of marble. It has been already brought under the notice of several architects, who have expressed their entire satisfaction with it, and are adopting it because of its high quality, economy in use, and the satisfactory results obtained.— *G. H. Hunt, in the Building News.*

A REMINDER OF BUTLER'S RULE IN NEW ORLEANS.

New Orleans, La., July 20, 1885.

To the Editors of the American Architect: —

Dear Sirs, — Referring to the above-named item in your number of July 18, I may venture the suggestion that "the doughty patriot" (General Butler) will scarcely care to take the whole credit for the inscription on the base of the Clay statue, which, instead of being *carved* in the *solid granite*, where dissatisfied citizens would have had *to dig it out*, was simply stencilled in black ink, in ten lines, six of which begin with words cut off just when the stencil reached the side of the panel, so that a fine sentiment is made ludicrous by this schoolboy bungling, and it is quite a satisfaction to see the ink quietly washing away. J. F.

WARM WALLS.

Winnipeg, Manitoba, Can., July 20, 1885.

To the Editors of the American Architect: —

Dear Sirs, — You will greatly oblige a subscriber to your very practical and valuable journal by a reply to the following query: What is the cheapest mode of making a wooden terrace warm? I thought of lime and sawdust between studs. Perhaps some one can suggest a better preventative of cold, less liable to become the harbor of insects. We have an outside temperature of forty degrees below zero to contend with.

Yours truly,
W. T. Dalton, Architect.

[The best way of keeping a wooden house warm is by back-plastering and paper. Two layers of good felt or cane-fibre paper over the outside boarding, and shingles — not clapboards over that, with a continuous sheet of back-plastering on laths between the studs, either nailed to fillets on the sides of the studs or put on other laths which are nailed directly to the inside of the outside boarding, will, with good interior plastering, brought down to the floor everywhere, give as warm an outside wall as can be obtained even with brick filling, and a warmer one than is likely to be got with a filling of sawdust or any other material which settles by its own weight. In back-plastering, care should be taken to get a good key to the mortar, and to bring it well up on the studs, sills, girts and plates, so that no crevices shall be left anywhere, and instead of leaving it off altogether at the floors, as builders often do, particular pains should be taken to make the spaces about the ends of the beams absolutely tight. Some architects, in addition to the back-plastering between the studs, make the inner plastering coat double, by nailing fillets over the first plastering, and then lathing and plastering again; but if the back-plastering between the studs is thoroughly done, the double inside plastering is seldom necessary, and if it is not well done, the house will be cold in spite of the double inner coat. In the way of minor precautions, care should be taken to close every crevice in the exterior skin of the building, through which a breath of the intensely cold winter winds can penetrate, to circulate thence over the house. Even with well-protected walls, there are usually vulnerable places around the window-frames, particularly under the stools, and these should always be ploughed on the under side, so that the shingles can be driven up into them to break the joint, and in addition to this it is well to tuck cotton from the inside into the open space just under the stool, as well as into other suspicious crevices. If either tarred or ordinary paper is used to put on the boarding around the window and door frames, under the outside casings, enough wind is likely to get in there, especially after the shrinkage of the casings and studs has torn the paper, to cause a chilly draught in the rooms in the vicinity of the windows, and it is better to use strips of zinc under the casings.—Eds. American Architect.]

LOCUST PINS.

Lynchburg, Va., July 15, 1885.

To the Editors of the American Architect: —

Dear Sirs, —Please inform me of the price of locust pins, the various kinds and dimensions, and where to be delivered, as well as whether the purchaser pays the freight or it is paid by the seller. Your attention to this will much oblige

Respectfully, J. B. Norville.

[Inquiry discovers that in this market only oak pins are used, which cost about a cent apiece. Locust has such good qualities, however, that they might be easily introduced.—Eds. American Architect.]

NOTES AND CLIPPINGS.

Cutting Glass by Electricity. — Electricity has now been applied to cutting glass tubes, an operation of some difficulty when the diameter is large; and iron wire half a millimeter in diameter is wound round the tube at the place required to be cut, and the ends are connected by means of copper conductors of the same diameter, with the poles of a powerful battery or other generator of electricity. This iron becomes heated when the current flows, and it is only necessary to cool it suddenly with a few drops of cold water in order to produce a clear cut. Glass tubes four inches in diameter are now cut in this way. — *Journal of the Society of Arts.*

Lifting a Masonry Arch. — *Les Annales des Travaux Publics* for July, 1885, describes the lifting to a more elevated position of a masonry arch, having a span 32.8 feet and a rise of 4.26 feet. The arch was fifteen feet wide, and at the key was 2.88 feet deep. A lining of plank was first put under the arch and then five centres made of wrought iron, apparently. Under each end of the arch were then placed two bents of timber, 5.8 feet apart, and well braced in both directions. Each of these bents rested on two longitudinal timbers and between these sticks, midway between the centres, were located double wedges, and between each set of wedges and directly under the centres and their posts were lifting screws. This arrangement having been carried out, the arch was cut at the springing lines with hammer and chisel, leaving, until all was ready, three points of support on each side. When the weight of the arch, which weighed 180 tons, was thrown entirely upon the centres several cracks made their appearance, and the crown sank about one and one-half inches. At the first turn of the screws, however, it was found that the cracks showed no signs of further increase, and the lifting was commenced with great uniformity. At each vertical inch of hoist the screws were stopped and the wedges tightly driven. The total distance raised was 1.4 feet, and this work was accomplished in fourteen hours. During the lifting a further sinking of about three-fourths of an inch took place, and the eight cracks extended from end to end of the arch. These cracks had a width of three-eighths of an inch, but they were lost in the interior of the masonry without appearing on the extrados. These fissures were filled with a thin grout of one part Portland cement to one part of sand, and eight days were allowed for the setting of this cement before the centres were removed. When the arch rested on its new abutments a fresh hair crack appeared, but without doing any further damage.

Substitutes for White Lead. — The attempt to introduce some other lead compound as a substitute for white lead appears to have a ceaseless charm for inventors, in spite of the very long list of complete and more or less costly failures in that direction. One of the most persevering laborers in this field appears to be Mr. A. French, who is the proprietor of several patents for obtaining the much desired substitute by means of lead "fume" from smelting furnaces. We recently noticed his proposal to make a black paint from the fume by converting it into lead sulphide. He had already patented the use of the fume, caught in a special condenser of which he was joint patentee with Mr. Wilson, as a white paint. By a still later patent he proposes to make use of this fume by acting upon it with hydrochloric acid, and thus producing an oxychloride of lead, which is to give "an excellent white pigment requiring very little oil to form white paint, of the consistency of ordinary white lead." We may take it that the condensed fume of Mr. French's former patent has not been largely adopted as white paint, as he now proposes to further act upon it with hydrochloric acid. It is very curious how the same attempts are made over and over again, and how little many inventors seem to trouble themselves to find out what has been done before them in the same direction. The preparation of a white paint from oxychloride of lead was proposed many years ago by Mr. Pattinson, inventor of the process for desilverizing lead which bears his name. He worked out a very beautiful and successful process for preparing the oxychloride direct from galena, and started a works to carry on the manufacture. The product was very beautiful, but it did not succeed in displacing the white lead, nor in even getting used to any extent alongside of it. The fact is, that notwithstanding the constant assertions of successive inventors that their particular preparation has the "consistency" and all the good qualities of white lead, it has so far invariably been found by the painters that such is not the case, and finally, after all the generations of experimenters, white lead and the old "Dutch" process for making it, still remain practically unaffected by their rivals.—*Engineering.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

322,426. SASH-FASTENER. — Winfield S. Cunningham, Springfield, O.

322,434. BENCH-CLAMP. — Hiram C. Fenton, Hartford, Conn.

322,446. REFRIGERATOR - BUILDING. — Joseph F. Hanrahan, Ottawa, Ontario, Can.

322,452. AUTOMATIC SAFETY-GUARD FOR ELEVATORS.—Franklin P. Hinds, Boston, Mass.

322,455. MACHINE FOR SANDING BRICK - MOULDS. Roswell S. Judson and Cyrus J. Hancock, Mattcawan, N. Y.

322,457. EXPANSION-JOINT. — Philipp Koch, New York, N. Y.

322,475. STEAM-BOILER. — Benjamin N. Payne, Elmira, N. Y.

322,485. ELEVATOR - HATCH GATE. — Charles T. Schulze, Cincinnati, O.

322,488. DOOR - HANGER. — Samuel Shreffler, Jr., Joliet, Ill.

322,505. MORTISE - LOCK. — Lewis Tighe, Detroit, Mich.

322,513. DOOR - CHECK. — Thomas G. Williamson, Philadelphia, Pa.

322,520. SASH - HOLDER. — Frank P. Catlin, Clayton, Wis.

322,531. TOGGLE-JOINT. — Frederick L. Ellis, New Haven, Conn.

322,549. HEATING-DRUM. — Jas. P. Lydon, Marysville, Cal.

322,553. SASH-FASTENER. — Joseph Paillet, Delaware, O.

322,559. BRICKS, BUILDING - BLOCKS, ETC., MADE OF PURIFIED ASHES AND LIME.—Ernest L. Ransome, Oakland, Cal.

324,563. APPLIANCE FOR LAYING BRICKS.—Martin Reymond, Paterson, N. J.

322,587. CHEMICAL FIRE-EXTINGUISHER.—Joseph A. De Mauclerc, Paris, France.

322,588. SHUTTER-WORKER. — John Dierks, Harlan, Iowa.

322,610.—STOVE OR FURNACE REGULATING DEVICE. Samuel W. Jackson, Chicago, Ill.

322,613. FIRE-ESCAPE. — George W. Kern, Chillicothe, O.

322,626. WATER - CLOSET. — Frank J. Merz, Newark, N. J.

322,634. HOT - AIR FIREPLACE. — Doyel Pearson, Memphis, Tenn.

322,648. DOOR-CHECK.—John H. Shaw, New Haven, Conn.

322,649. DOOR - SPRING. — John H. Shaw, New Haven, Conn.

322,650. GAS-ENGINE. — Cephas Shelburne, Richmond, Va.

322,659. MIXED PAINT.—William H. Van Keuren, Winona, Minn.

322,681. ELECTRIC DOOR - OPENER. — Thomas A. Casey, New York, N. Y.

322,685. AUTOMATIC SPRINKLER. — Frank B. Comins, New Bedford, Mass.

322,707. SASH-CORD FASTENER. —Geo. W. Graves, Norwalk, O.

322,732. VENETIAN BLIND.—William H. Lang, Burlington, Vt.

322,751. COMPOSITION FOR PLASTERING.—John W. Rees, Uniontown, Pa.

322,756. DERRICK.—David Sharp, Lemoore, Cal.

322,763. PNEUMATIC DOOR-CHECK. — George Vincent, Stockton, Cal.

322,790. MACHINE FOR FORMING FLANGES UPON SOFT PIPES.—Milton Chase, Haverhill, Mass.

322,813. STONE-LIFTER. — Daniel English, Brookville, Pa.

322,816. MACHINE FOR PLANING AND FINISHING THIN PIECES OF WOOD. — Addison M. Ford and Jas. M. Moore, Jericho, Vt.

322,819. WOOD-PRESERVING APPARATUS.—Ludvig Hansen and Andrew Smith, Wilmington, N. C.

322,873. FIRE-PROOF CEILING. — Peter B. Wight, Hyde Park, Ill.

SUMMARY OF THE WEEK.

Baltimore.

HOME.—George Archer, architect, has prepared drawings for the Young Women's Christian Association for a three-st'y brick building, 25′ x 85′, to be erected cor. Barret and Liberty Sts., to cost about $12,000; John Haswell & Son, builders.

BUILDING PERMITS.—Since our last report eighteen permits have been granted, the more important of which are the following: —

S. B. Carey, three-st'y brick building, w s McCulloh St., between Hoffman and Dolphin Sts.

W. F. Stubbs, 5 two st'y brick buildings, w s Sheppard Alley, between Columbia Ave. and St. Peter Street.

Hoen Building Co., six-st'y brick building, e s North St., n of Lexington St.

S. R. Robinson, 5 three-st'y brick buildings, e s Madison Ave., commencing s e cor. North Ave.

Jos. L. Amos, 14 two-st'y brick buildings, e s Fulton Ave., commencing s e cor. Baker St.

H. A. Zeigler, 5 two-st'y brick buildings, e s Valley St., n of Preston St.

Jacob Oster & Son, 4 two-st'y brick buildings, commencing s e cor. Madison and Constitution Sts.

Boston.

BUILDING PERMITS.—*Millett St.*, Ward 24, 3 two-st'y pitch-roof dwells.; owner, J. P. Carlton.

Tremont St., Ward 25, one-st'y shed; owner, John F. Walsh.

Eastman St., Ward 20, 3 two-st'y pitch-roof dwells.; owner, John H. Gigie.

Church St., Ward 25, two-st'y flat-roof dwell.; owner, John Brennan.

Wesley Ave., Ward 24, three-st'y flat-roof dwell.; owner, Thomas W. Tuttle.

East Eighth St., Ward 14, 2 three-st'y flat-roof dwells. and store; owners, H. C. & A. H. Menslage.

Foster St., Ward 24, 2 three-st'y flat-roof dwells.; owner, E. E. Currier.

Cobden St., Ward 24, 2 two-st'y pitch-roof dwells. and mechanical office; owner, W. B. Quigley.

Montrose Ave., Ward 21, two-st'y pitch-roof dwell.; owner, J. K. Smyth.

Poplar St., Ward 23, two-st'y pitch-roof dwell.; owner, Mrs. H. B. Leavitt.

Albany St., Ward 17, two-st'y flat-roof shed; owner, A. F. Leatherbee.

Hand Pl., Ward 21, three-st'y flat-roof dwell.; owner, H. J. Bartlett.

Copeland St., Ward 21, 2 two-st'y pitch-roof dwells.; owner, Carl Eberhard.

Everett St., Ward 2, 2 three-st'y flat-roof dwells.; owner, John McCormick.

Ashford St., Ward 25, two-st'y pitch-roof dwell.; owner, Mrs. E. E. Rogers.

Washington St., Ward 23, one-st'y flat-roof structure for mechanical purposes; owner, Thomas J. Tobin.

Englewood Ave., Ward 25, two-st'y pitch-roof dwell.; owner, A. G. Weeks.

Silver St., Ward 15, two-st'y flat-roof stable; owner, H. N. Hatch.

Chelsea St., Ward 1, two-st'y pitch-roof dwell.; owner, Mrs. Margaret Caddy.

Brooklyn.

BUILDING PERMITS. — *Diamond St.*, n e cor. Nassau Ave., three-st'y frame (brick-filled) tenement, gravel roof; cost, $4,300; owner, Wm. H. Hasselbrook, 103 Diamond St.; architect, J. J. Randall.

Clinton Ave., Nos. 312 *and* 314, 2 three-st'y brick and Jersey sandstone dwells., tin roofs; cost, $22,000; owner, Henry F. Hutchinson, 308 Clinton Ave.; architect, S. F. Eveleth.

Clifton Pl., No. 281, n s, 200′ w Nostrand Ave., four-st'y brick tenement, gravel roof; cost, $12,000; owner, architect and builder, J. Graham Glover, 219 Montague St.

Reid Ave., s w cor. Greene Ave., 5 four-st'y brick store and tenements, tin roofs; cost, each, $9,500; owner, architect and builder, H. Grasman, 142 Marcy Ave.

Seventeenth St., n s, 80′ w Sixth Ave., three-st'y frame tenement (brick-filled), tin roof; cost, $3,383; owner, Frederick Schwartje, Atlantic Ave., cor. Third Ave.; architect, W. H. Wirth; builders, Powderly & Murphy.

Stockton St., No. 295, n s, 125′ e Sumner Ave., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,000; owner, Mary Murphy; architect, Th. Engelhardt.

George St., n s, 100′ w Knickerbocker Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner and builder, Alex. Eschenbach, South Fifth St.; architect, Th. Engelhardt.

Central Ave., s w cor. Elm St., 4 three-st'y frame (brick-filled) store and tenements, tin roofs; cost, each, $5,000; owner and builder, John Kramer, Bushwick Ave., near Elm St.; architect, Th. Engelhardt.

Berkeley Pl., s s, 289′ e Seventh Ave., three-st'y brick and freestone dwell., tin roof; cost, $12,500; owner, David A. Boodry, 206 Berkeley Pl.; architects, J. W. Walter and E. B. Sturges.

Vernon Ave., n s, 155′ e Nostrand Ave., two-st'y and attic brick dwell., slate and tin roof; cost, $10,000; owner, Mrs. S. Vanderveer, Vernon Ave., cor. Nostrand Ave.; architects, Parfitt Bros.; builder, A. Miller.

Greene Ave., s s, 120′ e Reid Ave., 3 two-st'y and three-st'y rear brown-stone dwells., tin roofs; cost, each, $6,000; owner, B. F. Constable, on premises; architect and contractor, Jos. T. Miller; mason, W. P. Osborn.

Greene Ave., s s, 100′ e Reid Ave., two-st'y and basement and three-st'y rear brown-stone dwells., tin roofs; cost, $6,000; owner, Geo. H. Smith, Greene Ave., cor. Reid Ave.; architect, J. T. Miller.

Van Brunt St., s e s, at river front, four-st'y brick storehouse, gravel roof; cost, $30,000; owner, Wm. Beard, 140 Amity St.; builders, P. Kelly & Son and H. Turver.

McDonough St., No. 399, between Stuyvesant and Reid Aves., four-st'y brick storage, tin roof; cost, $3,500; owner, John Loader, 401 McDonough St.; architect, A. Hill; builder, A. Sutterlin.

Melrose St., s s, 95′ w Hamburg Ave., three-st'y frame (brick-filled) school-house, tin roof; cost, $7,000; owner, St. Leonhards Congregation, on premises; architect, G. Hillenbrand; builders, J. Wagner and W. Bayer.

Hicks St., No. 64, w s, 25′ n Cranberry St., four-st'y brick tenement, tin roof; cost, $8,500; owner, Henry Stump, 64 Hicks St.; architect, M. Thomas; builders, J. Thatcher and E. S. Boyd & Son.

Classon Ave., No. 146, e s, between Myrtle and Park Aves., three-st'y frame (brick-filled) tenement, tin roof; cost, $5,400; owner, Daniel F. Dwyer; architect, J. Plate; builders, J. T. Hanlon and C. Collins.

Seventh Ave., n e cor. Twelfth St., 3 two and three st'y brick store and dwells., tin roofs; cost, $20,000; owner, T. Brown, 381 Eleventh St.; architect, I. D. Reynolds; builder, W. Brown.

Powers St., s s, 142′ e Leonard St., two-st'y frame (brick-filled) church, tin roof; cost, $7,500; owners, Trustees Methodist Episcopal Church; architect, O. H. Doolittle; builders, S. V. Hyers and O. H. Doolittle.

Myrtle Ave., n w cor. Graham St., 4 four-st'y brick stores and flats, tin roofs, wooden cornices; cost, each, $12,000; owner, Cornelius Donnellon, 116 Pacific St.; architects, G. P. Chappell & Co.

Halsey St., n s, 179′ e Reid Ave., 4 two-st'y brick dwells., tin roofs; cost, each, $3,000; owners, Frederick and John Dhuy, 885 Herkimer St.; builder, J. Dhuy.

ALTERATIONS. — *Prince St.*, w s, 120′ s Concord St., two cross-walls of brick; cost, $4,448; owners, Hibbers & Co., Prince St., cor. Concord St.; architect, M. J. Morrill; builders, P. Carlin & Sons.

Marcy Ave., cor. Lynch and Heyward Sts., two-st'y brick extension, wings on both sides, tin roof; cost, $35,000; owner, State of New York; architect, E. F. Gaylor; builders, W. & T. Lamb, Jr., and Jenkins & Gillies.

Chicago.

BUILDING PERMITS. — A. Engle, two-st'y dwell., 556–558 North State St.; cost, $15,000; architect, Halberg.

H. Cassard, 11 two-st'y dwells., 373–387 Thirty-third St.; cost, $20,000.

G. Bennett, two-st'y dwell., 2629 Halsted St.; cost, $3,000.

F. S. Mueller, three-st'y factory, 167–169 Indiana St.; cost, $7,000.

W. M. Hoyt, 2 four-st'y dwells., 240–242 Illinois St.; cost, $8,000.

W. M. Hoyt, 2 four-st'y dwells., 247–249 Illinois St.; cost, $8,000.

T. Kirkwood, two-st'y dwell., 852 Washington Boulevard; cost, $5,000; architect, J. W. Cassell.

F. Hauck, three-st'y shop, 224–228 Blue Island Ave.; cost, $6,000.

H. Hill, three-st'y flats, 346 Twenty-second St.; cost, $4,000.

The Board of Education, three-st'y school-house, 840–860 Twenty-first St.; cost, $58,000; architect, J. J. Flanders.

The Board of Education, three-st'y storehouse, 155–157 West Monroe St.; cost, $10,000.

P. Larsen, three-st'y addition, 120 West Huron St.; cost, $3,500.

F. Staumer, three-st'y dwell., 212 North State St.; cost, $4,000.

H. Schnell, three-st'y flats, 223 Lincoln St.; cost, $20,000; architect, C. A. Gottig.

C. Cofferta, three-st'y flats, 65 Illinois St.; cost, $3,000.

J. V. Klober, two-st'y dwell., 1–3 Ritchie St.; cost, $4,500.

H. Bower, three-st'y store and dwell., 3750 State St.; cost, $8,000.

K. Sherman, two-st'y dwell., 142 Augusta St.; cost, $5,000.

C. C. Crowhurst, 4 one-st'y cottages, 1061–1067 Elston Ave.; cost, $4,400.

W. L. Moss, agent, 3 three-st'y dwells., 3813–3817 Vincennes Ave.; cost, $16,000.

D. F. Anderson, two-st'y flats, 927 North Hoyne Ave.; cost, $2,500.

W. B. Phillips, 3 three-st'y dwells., 3319–3323 South Park Ave.; cost, $20,000.

P. W. Brownell, three-st'y dwell., 48 Bryant Ave.; cost, $4,600.

Wm. Flynn, two-store and dwell., 795 Thirty-seventh St.; cost, $4,000.

E. Hitchcock, 2 two-st'y dwells., 3251–3253 Rhodes Ave.; cost, $10,000.

G. Weiss, two-st'y dwell., 3410 Wabash Ave.; cost, $10,000.

J. Monohan, two-st'y dwell., 980 West Twelfth St.; cost, $4,500.

C. Schuelke, two-st'y dwell., 371 West Huron St.; cost, $2,500.

N. Marsh, two-st'y dwell., 362 Centre Ave.; cost, $3,500.

E. Mark, three-st'y dwell., 185 Burling St.; cost, $5,000.

F. Deke, three-st'y store and flats, 412 North Ashland Ave.; cost, $5,000.

Chicago & North Western Railway Co., engine-house, Robey and Fourteenth Sts.; cost, $12,000.

Wm. Hammerstrom, two-st'y dwell., 333 Burling St.; cost, $4,500.

Anson Kaiser, three-st'y flats, 23 Lane St.; cost, $8,000.

Chicago City Railway Co., one-st'y addition, 2001–2009 Dearborn St.; cost, $6,000.

C. Greenwold, six-st'y warehouse, 249–254 Kinzie St.; cost, $15,000.

Wm. W. Hayes, one-st'y additional, 106–108 North Sangamon St.; cost, $3,500.

C. Jevne, two-st'y dwell., 644 Lasalle St.; cost, $20,000.

W. P. Fitzpatrick, 3 two-st'y stores and dwells., Ogden Ave.; cost, $14,000.

M. A. L. Sweeney, three-st'y dwell., 375 Oak St.; cost, $12,000.

G. Paul, two-st'y flats, 618 Sedgwick St.; cost, $5,000.

B. Lindauer, two-st'y dwell., 3312 Wabash Ave.; cost, $10,000.

F. Jensen, three-st'y store and dwell., 23 Clybourne Ave.; cost, $5,000.

F. W. Verhoeven, two-st'y dwell., 2410 Dearborn St.; cost, $4,500.

Mrs. A. Halsted, 2 two-st'y dwells., 708–710 North Park Ave.; cost, $8,000.

C. B. Farwell, repair building, 409 Fifth Ave.; cost, $5,000.

B. Rowe, three-st'y store and dwell., 277 Noble St.; cost, $7,000.

Mrs. J. Clare, two-st'y dwell., 3212 Wabash Ave. cost, $6,000.

McKey Estate, 6 three-st'y store and dwells., 3311–3321 State St.; cost, $30,000.

J. Nolan, two-st'y store and dwell., 3113 Halsted St.; cost, $3,000.

G. F. Mueller, two-st'y store and flats, 651 Centre Ave.; cost, $4,000.

D. Gawne, two-st'y dwell., 3133 Portland Ave.; cost, $2,500.

C. O. Gleason, 2 two-st'y dwells., 3720–3722 Johnson Pl.; cost, $3,500.

C. Schweegler, two-st'y dwell., 599 Lincoln St. cost, $2,500.

J. C. Smith, 2 four-st'y stores and flats, 1018-1020 Madison St.; cost, $13,000.

C. Lion, store, 1155 Milwaukee Ave.; cost, $3,500.

Illinois Vault Co., one additional st'y and repairing building, 111-117 Dearborn St.; cost, $80,000; architects, Burnham & Root.

Cincinnati.

BUILDING PERMITS. — W. C. Cochran, three-st'y building, Gilliman Ave.; cost, $5,960.

Jno. Webb, Jr., 4 two-st'y brick buildings, Eden St. and Auburn Ave.; cost, $12,000.

J. Feldham, two-and-one-half-st'y building, Wheller and Warner Sts.; cost, $7,000.

Wm. More, three-st'y building, Commerce and Walnut Sts.; cost, $27,000.

F. Groveman, three-st'y building, State Ave.; cost, $5,000.

Dr. T. C. Smuk, 2 four-st'y buildings, Breeman St., cor. Thirteenth St.; cost, $10,000.

Fred. Lecke, four-st'y building, Elm St., cor. Fifteenth St.; cost, $6,000.

Miss Romer, remodel building cor. Third and Killgour Sts.; cost, $5,000.

Six repairs; cost, $6,450.

Total repairs to date, $135,363.

Permits to date, 633.

Kansas City, Mo.

BUILDING PERMITS. — J. B. Bott, business block, 1418 Walnut St.; cost, $4,500.

S. C. Fancher, frame business block, cor. Fifth and Lydia Aves.; cost, $4,000.

Trustees of the Christian Church, Summit St., frame church, 40′ x 60′; cost, $4,100.

Brockett & Churchill, brick business house, 47 West Ninth St., cost, $3,000.

S. C. Fancher, frame business block, cor. Fifth and Lydia Aves.; cost, $4,000.

William Gabel, brick dwell. 612 Oak St.; cost, $4,000.

William Brendel, brick block, cor. Eighth and Charlotte Sts.: cost, $10,000.

C. H. Hartman, brick business block, cor. Fourth and Grand Aves.; cost, $4,500.

H. T. Hovelmann, dwell., 809 East Eighteenth St.; cost, $3,000.

John S. Sutherland, brick block, cor. Tenth and Cherry Sts.; cost, $6,000.

John O'Leary, frame dwell., cor. Nineteenth and Harrison Sts.; cost, $4,000.

B. Estil, frame block, Harrison St.; cost, $5,000.

Capt. Weller, brick dwell., 100 Oak St.; cost, $3,000.

James S. Mathews, brick block, Dundee Pl., cor. Tracy Ave.; cost, $5,000.

T. M. James, brick dwell., Perry Pl., cor. Harrison St.; cost, $10,000.

Minneapolis, Minn.

BUILDING PERMITS.—J. W. Tousley, two-st'y wooden tenement and barn, cor. Twenty-sixth St. and Williams Ave.; cost, $17,200.

C. P. Hazeltine, addition to wooden dwell., Portland Ave., bet. Twenty-sixth and Twenty-seventh Sts., s; cost, $3,000.

Willard B. Pinneo, two-st'y wooden dwell., Nicollet Ave., bet. Twenty-eighth and Twenty-ninth Sts.; cost, $3,500.

Coe & Forman, four-st'y brick store building, Third Ave., n, bet. Fourth and Fifth Sts.; cost, $18,000.

Joseph Menard, two-st'y brick dwell., Oliver Ave., cor. Fourteenth Ave., n; cost, $3,900.

John Booth, two-st'y wooden dwell., Pennsylvania Ave. cor. Fourteenth Ave., n; cost, $5,500.

Henry F. Brown, two-st'y wooden dwell. and barn, Aldrich Ave., bet. Seventeenth and Eighteenth Aves., n; cost, $5,000.

Minneapolis Gas Light Company, brick retort-house, Cedar Ave. cor. Nineteenth Ave., s; cost, $10,000.

New York.

CHURCH.— On Madison Ave., cor. Eighty-eighth St., a Lutheran church is to be built, from designs of Mr. Arthur Crooks.

FLAT.—On the n w cor. of Sixth Ave. and Fifty-second St., a six-st'y flat with stores, 50′ x 100′, brick, stone and terra-cotta, is to be built for Mr. Peter Doelger, from plans of Mr. Julius Kastner.

HOUSES. — On the s s of Seventy-second St., between Ninth Ave. and Boulevard, 5 four-st'y and basement dwells., brown-stone fronts, are to be built at a cost of $90,000, from plans of Messrs. Thom & Wilson.

On the n s of Seventy-ninth St., 350′ e of Tenth Ave., 6 four-st'y and basement fireproof houses are to be built by Messrs. Hubert, Pirsson & Co.

One Hundred and Fiftieth St. and Boulevard, cottage for Mr. J. Pickering; H. G. Knapp, architect.

On the n s of One Hundred and Twenty-fourth St., 217′ e of Sixth Ave., 3 three-st'y and basement houses, two 18′ 4″ and one 18′ front, are to be built for Mr. A. G. Gabay, from designs of Messrs. Thom & Wilson.

MONUMENT.—There is a good deal of interest in regard to the plans for the Grant monument, and it is hoped that there will be an open competition.

SCHOOL. —For St. Anne's Church a brick school is to be built on Brook Ave., opposite One Hundred and Fortieth St., from plans of Mr. C. C. Haight.

BUILDING PERMITS. — *East Thirty-ninth St., No.* 144, three-st'y brick stable and coach-house, tin roof; cost, $18,000; owner, D. W. James, 40 East Thirty-ninth St.; architect, F. Jacobson; builder, George Mulligan.

West Twentieth St., Nos. 124 *and* 126, three-st'y brick stable, tin roof; cost, $20,000; owner, Hugh O'Neill, 149 West Twentieth St.; architect, M. C. Merritt.

West Thirty-sixth St., No. 67, five-st'y brick flat-tin roof; cost, $30,000; owner, Mrs. Geo. J. McGour, key, on premises; architects, D. & J. Jardine.

Thirty-ninth St., s s, 250′ e Eleventh Ave., 6 five-st'y brick tenements, tin roofs; cost, each, $16,000; owner and builder, David Christie, 413 West Fifty-seventh St.

West Forty-eighth St., No. 350, four-st'y brick tenement and extension, tin roof; cost, $4,500; owner, Edward D. Bertine, 328 West Forty-seventh St.; architect, C. F. Ridder, Jr.

Tenth Ave., e s, 75′ 6″ n Thirtieth St., five-st'y brick tenement with stores, tin roof; owner, Robert Greacen, 427 West Thirtieth St.; architect, J. H. Valentine.

Eighty-first St., n s, 80′ w Ave. A, five-st'y brick tenement, tin roof; cost, $12,000; owner, Mathias A. Schneider, 419 East Eighty-first St.; architect, Julius Kastner.

Eighty-first St., n s, 106′ w Ave. A, 3 five-st'y brick tenements, tin roofs; cost, total, $50,000; owner and architect, same as last.

One Hundred and Sixth St., s w cor. Lexington Ave., four-st'y brick flat, tin roof; cost, $15,000; owner, Thos. F. Cooke, 351 East Eighty-seventh St.; architect, G. A. Schellenger.

Lexington Ave., e s, 80′ 11″ s One Hundred and Sixth St., four-st'y brick flat, tin roof; cost, $20,000; owner and architect, same as last.

East One Hundred and Eleventh St., No. 204, one-st'y brick stable, tin roof; cost, $4,000; owner, G. Wallace Bryant, 113 East One Hundred and Eleventh St.; architect, A. Spence.

Third Ave., w s, 25′ 2″ s One Hundred and Sixth St., 3 five-st'y brick (stone-front) tenements, tin roofs; cost, each, $18,000; owner, John D. Karst, Jr., 2006 Second Ave.; architect, Richard Berger; builder, J. D. Karst.

One Hundred and Nineteenth St., n s, 410′ w Fifth Ave., three-st'y brick dwell., tin roof; cost, $10,000; owner and builder, James C. Miller, 359 West Forty-seventh St.; architects, McKim, Mead & White; mason, Joseph Thompson.

Eighty-fourth St., n s, 273′ e Ave. A, 5 four-st'y brick (stone-front) tenements, tin roofs; cost, each, $13,500; owners, Schmidt & White, 13 Second Ave.; architect, John Brandt.

East One Hundred and Twenty-fifth St., Nos. 320 and 322, 2 five-st'y brick (stone-front) tenements, tin roofs; cost, each, $15,000; owner, Fernando Yost, 316 East One Hundred and Twenty-fifth St.; architect, A. Spence.

Seventieth St., n s, 225′ e Eleventh Ave., 3 three-st'y and basement brick dwells., tin roofs; cost, each, $9,000; owner, E. Stanton Riker, Mt. Vernon, N. Y.; architect, W. H. Youngs; mason, H. A. Donnelly.

West Eighty-second St., Nos. 426-434, 5 four-st'y brick dwells , tin and slate roofs; cost, each, $25,000; owner and builder, Virgilio Del Genovese, 268 Bowery; architect, Emanuel Gandolfo.

Eighty-second St., s s, 362′ 6″ w Ninth Ave., 2 four-st'y brick dwells., deck roofs of tin, mansard fireproof; cost, each, $16,000; owner, Richard V. Lewis, 445 West Eighty-second St., and Henry C. Conger, 436 West Forty-third St.; architects and masons, F. & W. E. Bloodgood.

One Hundred and Nineteenth St., n s, 426′ 8″ w Fifth Ave., 3 three-st'y brick (stone-front) dwells., tin roofs; cost, each, $8,000; owners and builders, John Miller, 753 Seventh Ave., Wallace Van Dorn, 304 West Thirtieth St., and Joseph Thompson, 256 West Fifty-second St.; architect, J. E. Terhune; mason, Joseph Thompson.

One Hundred and Forty-sixth St., s s, 240′ e Tenth Ave., four-st'y brick flat, gravel roof; cost, $10,000; owner, John Donnellon, One Hundred and Forty-sixth St., near S. Nicholas Ave.; architect, B. W. Warner; builders, J. & T. Donnellon.

One Hundred and Sixty-seventh St., s s, 175′ e Tenth Ave., three-st'y brick tenement, tin roof; cost, $4,000; owner and builder, Frank Lober, One Hundred and Sixty-sixth St., near Tenth Ave.; architect, Wm. Simpson.

St. Nicholas Ave., e s, 152′ s One Hundred and Thirty-third St., 4 five-st'y brick dwells., with extensions, tin roofs; cost, each, $18,000; owner and builder, H. J. Beaudet, 1437 Lexington Ave.; architect, J. H. Valentine.

Eighth Ave., s e cor. One Hundred and Thirty-first St., 2 five-st'y brick tenements, tin roofs; owner, O. C. Ferris, 762 Madison Ave.; architect, J. H. Valentine.

One Hundred and Thirty-first St., s s, 76′ 6′ e Eighth Ave., four-st'y brick store and tenement, tin roof; owner and architect, same as last.

One Hundred and Thirty-first St., s s, 227′ w Fifth Ave., 6 three-st'y brick (stone-front) dwells., tin roofs; cost, each, $10,000; owner, Michael Sampter, Fifth Ave., s w cor. One Hundred and Thirty-first St.; architects, Cleverdon & Putzel.

Morris Ave., w s, 53′ 3″ s One Hundred and Forty-ninth St., three-st'y brick tenement, tin roof; cost, $10,000; owner, Henry Fallerman, 448 East One Hundred and Forty-ninth St.; architects, Schmidt & Garvin.

West Fiftieth St., Nos. 539 *and* 541, 2 five-st'y brick tenements, tin roofs; cost, $11,000 and $13,000; owner, Jacob Schneider, 537 West Fiftieth St., and James Stroh, 533 West Fiftieth St.; architect, James W. Cole; builder, John Jordan.

Fifth Ave., s e cor. Sixty-ninth St., four-st'y brick dwell., slate roof; cost, $90,000; owner, Ogden Mills, 35 Wall St.; architect, R. M. Hunt; builder, D. H. King, Jr.

Sixty-eighth St., s s, 120′ w Third Ave., three-st'y brick stable, tin roof; cost, $15,000; owner, Joseph J. O'Donohue, 44 West Fifty-fourth St.; architect, J. M. Dunn; builders, Michael Reid and John Murphy.

Lexington Ave., No. 1773, three-st'y and basement brick (stone front) dwell., tin roof; cost, $8,000; owner, Hannah M. French, 152 East One Hundred and Eleventh St.; architect, A. Spence.

Seventy-second St., s s, 300′ e Tenth Ave., 5 four-st'y and basement brick (stone front) dwells., tin roofs; cost, each, $25,000; owner, Geo. J. Hamilton, 2078 Fifth Ave.; architects, Thom & Wilson, builder, not selected.

One Hundred and Sixteenth St., n s, 100′ w New Ave., 3 three-st'y brick dwells., tin roofs; cost, each, $8,000; owner, Howard D. Hamm, 162 East One Hundred and Twenty-third St.; architects, Cleverdon & Putzel.

One Hundred and Thirty-first St., n s, 75′ w Sixth Ave., 4 three-st'y brick (stone front) dwells., tin roofs; cost, each, $10,600; owner, Samuel O. Wright, West One Hundred and Thirtieth St.; architects, Cleverdon & Putzel.

One Hundred and Thirty-second St., s s, 375′ w Sixth Ave., 3 three-st'y brick (stone front) dwells., tin roofs; cost, each, $9,000; owner, S. J. Wright, 201 West One Hundred and Thirtieth St.; architects, same as last.

Eighth Ave., w s, 149′ 11″ s One Hundred and Thirty-third St , 3 five-st'y brick tenements with stores, tin roofs; cost, each, $18,000; owner and builder, Homer J. Beaudet, 1437 Lexington Ave.; architect, J. H. Valentine.

St. Nicholas Ave., e s, 75′ n One Hundred and Twenty-sixth St., 3 three-st'y brick dwells., tin roofs; cost, each, $10,000; owner, Nassau Building Co., 20 Nassau St.; architect, A. I. Finkle.

Grounds of St. John's College, Fordham, 500′ n Pelham Ave., three-st'y stone boiler-house, slated roof; cost, $35,000; owner, Rev. F. P. Dealy, St. John's College, Fordham; architect, P. C. Kelly; builders, McGivney & McLoughlin and J. Rodgers.

Courtlandt Ave., s e cor. One Hundred and Fifty-ninth St., 2 four-st'y brick tenements, tin roofs; cost, $7,500 and $10,000; owner, Wm. Wolfarth, cor. Courtlandt and One Hundred and Fifty-eighth St.; architect, Wm. Kusche.

ALTERATIONS. — *Third Ave., No.* 755, altered for double tenement above store floor, new show-window; cost, $5,000; owner, M. P. Breslin, 114 East Seventieth St.; architect, J. B. Franklin; builder, J. Young.

Sixth Ave., No. 330, two-st'y brick extension, irregular tin roof; cost, $6,000; owners, Henry Moffet, et al., trustees, 328 Sixth Ave.; architect, H. R. Marshall.

West Forty-seventh St., No. 13, two-st'y and basement brick extension, tin roof; cost, $10,000; owner, Charles F. Southmayd, on premises; architect, W. Schickel; builders, J. Webb & Son and J. Downey.

East Fourteenth St., No. 20, new iron front; cost, $3,800; owner, W. J. Fielding, New Britain, Conn.; architect, A. Craig; builders, Jones, Archer & Co.

West Forty-fifth St., No. 226, raised two stories; cost, $6,000; rector, S. M. Brown, on premises; architect, S. D. Hatch; builders, R. L. Darragh & Co.

Courtlandt Ave., Nos. 624 *and* 626, raised one st'y also three-st'y frame extension, tin roofs; cost, $3,500; owner, Jacob Sauter, 502 East Seventeenth St.; builder, L. Sauter.

Fifth Ave., No. 483, five-st'y and one-st'y brick extension, tin roofs; cost, $10,000; owner, James McCreery, Inwood; architect, John Sexton; builder, E. H. Miller.

Fourth Ave., No. 107, attic raised to full story, also internal alterations; cost, $5,000; owners, Wm. T. Smith and Percival C. Smith, Great Neck, L. I.; architects, Burger & Baylies.

West Thirty-eighth St., No. 430, one-st'y brick extension, tin roof; cost, $5,000; owners, T. C. Lyman & Co., 418 West Thirty-eighth St.; architects, Lederle & Co.

Philadelphia.

BUILDING PERMITS. — *Chew Ave.*, cor. Chelton Ave., 2 three-st'y dwells., 18′ x 48′; Jas. Morris, contractor.

Fifty-first St., cor. Florence St., two-st'y dwell., 16′ x 30′; And. Mately, contractor.

Sixty-fourth St., cor. Elmwood Ave., two-st'y dwell., 32′ x 42′; Jno. Wood, contractor.

Forty-ninth St., n e cor. Paschall St., 2 two-st'y dwells., 14′ x 40′; Jno. Wood, contractor.

Second St., s w cor. Moore St., 3 two-st'y dwells., 15′ x 50′; Dunbar & Myers, contractors.

Germantown Ave., No. 1425, three-st'y dwell., 20′ x 64′; E. Schmidt, contractor.

Germantown Ave., No. 1425, brewery, 16′ x 39′; E. Schmidt, contractor.

Germantown Ave., No. 1423, bottling-house and stable, 16′ x 42′ and 20′ x 60′; E. Schmidt, contractor.

Germantown Ave., No. 1423, three st'y dwell., 20′ x 64′; E. Schmidt, contractor.

Malvern St., s of Clearfield St., 2 two-st'y dwells., 18′ x 42′; J. K. Pyle, owner.

Funk St., cor. Ditman St., two-st'y dwell., 16′ x 45′; Duryea & Childs, contractors.

Funk St., cor. Ditman St., two-st'y dwell., 25′ x 30′; Duryea & Childs, contractor.

North Ninth St., No. 2613, two-st'y store and dwell., 18′ x 55′; F. A. Colamer, contractor.

Fairhill St., n Lehigh Ave., two-st'y dwell., 17′ x 44′; F. A. Colamer, contractor.

Sixteenth St., above Columbia Ave., 5 three-st'y dwells., 18′ x 68′; C. M. Baker, owner.

Coral St., n Adams St., one-st'y addition 45′ x 160′; S. Humphries, contractor.

Memphis St., above Montgomery Ave., 2 two-st'y dwells., 16′ x 38′; S. Humphries, contractor.

Amboy St., No. 1616, addition to dwell., 16′ x 38′; J. F. Hutzell, owner.

Gowen Ave., two-st'y dwell., 30 x′ 45′; W. R. Dougherty, contractor.

Ashmead St., e Morris St., three-st'y dwell., 16′ x 30′; W. E. Carr, contractor.

Filbert St., No. 171, five-st'y store, 20′ x 117′ C. D. Supplee, contractor.

Kirkbride St., s w cor. Garden St., three-st'y store and dwell., 18′ x 56′; A. W. Linn, contractor.

Fifteenth St., cor. Race St., two-st'y store, 18′ x 35′; Geo. Watson, contractor.

Catharine St., No. 1432, three-st'y dwell., 18′ x 62′; Jno. Eccles, contractor.

Germantown Ave., s Coulter St., three-st'y brick building, 20′ x 48′; W. Mackey, contractor.

Chelton Ave., near Chew St., two-st'y dwell., 16′ x 42′; W. Mackey, contractor.

St. Louis.

BUILDING PERMITS. — Thirty-two permits have been issued since our last report, ten of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows: —

H. A. Abele, two-st'y brick dwell.; cost, $3,600; contractor, Jos. Stander.

J. H. Degenhardt, two-st'y brick dwell.; cost, $2,500; contractor, A. Lagree.

Boehr & Blogmann, two-st'y double brick dwell.; cost, $3,850; contractors, J. & C. Lingemann.

PUBLISHERS' DEPARTMENT.

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New Advertisements.

WADSWORTH, HOWLAND & CO. (Boston, Mass.), Architects' Materials. Page iii.
VENETIAN BLIND CO. (Burlington, Vt.), Venetian Blinds. Page vi.
WILSON BOILER CO. (Westfield, N. Y.), Heating Apparatus. Page xviii.

Dissolution of Partnership.

The Copartnership heretofore existing under the name of **JAMES R. OSGOOD & CO.**, is hereby dissolved.

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BENJAMIN H. TICKNOR.
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Boston, July 18, 1885.

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GEORGE F. GODFREY.

Boston, July 18, 1885.

BUILDING INTELLIGENCE

St. Louis. (*Continued.*)

A. Voelke, 2 adjacent brick tenements, cost, $2,900; contractor, F. Knittel.

F. W. McManus, five-st'y brick store; cost, $17,000; architect, J. Beattie; contractor, A. T. Hoffmann.

Mrs. M. Garold, two-st'y double brick dwell.; cost, $5,000; contractors, B. Weber & Co.

J. Dickman, 2 adjacent two-st'y stores and rooms above; cost, $6,000; architect, H. C. Peipers.

J. V. Hogan, addition to three-st'y store; cost, $8,000; architect, Johnson; contractor, H. E. Roech.

Memorial Home Association, four-st'y brick addition; cost, $5,500; architect, S. C. Bulkley; contractors, Chapman & Thursby.

W. S. O'Brien, two-st'y brick dwell.; cost, $2,700; contractor, W. S. O'Brien.

F. Wehrle, two-st'y brick dwell.; cost, $4,000; contractor, F. Muller.

R. Schultz, two-st'y brick store and rooms above; cost, $3,500; B. J. Goesse, architect; Bothe & Ratterman, contractors.

N. F. Qitting, 3 adjacent two-st'y brick dwells.; cost, $10,000; Beinke & Co., architects; Thos. Manning, contractor.

Paul Kempf, two-st'y double brick tenement; cost, $3,000; John Ryan, contractor.

Jos. Specht, two-st'y brick dwell.; cost, $12,000; C. C. Helmers, architect; Chas. Gerhard, contractor.

Jos. Specht, two-st'y brick dwell.; cost, $12,000; C. C. Helmers, architect; Chas. Gerhard, contractor.

G. Kaufold, three-st'y store and tenement; cost, $18,000; Bothe & Ratterman, contractors.

Chas. Meier, two-st'y brick dwell.; cost, $4,750; Wm. Whri, architect; A. Whri, contractor.

F. T. Wade, two-st'y brick dwell.; cost, $2,720; J. J. Shaughnessy, contractor.

C. C. Kreibohn, two-st'y brick dwell.; cost, $4,100; O. P. Koenig, architect; A. Whri, contractor.

D. A. Tracy, two-st'y brick dwell.; cost, $2,700; J. J. Shaughnessy, contractor.

Jno. Dasster, three-st'y brick tenement; cost, $2,800; John Schott, contractor.

St. Louis Mutual House Building Co., No. 3, two-st'y brick dwell.; cost, $2,600; E. Mortimer, architect; Pritchett & Moore, contractors.

Thos. Hodson, three-st'y brick store; cost, $9,000; J. Beattie, architect; Pritchett & Moore, contractors.

St. Paul, Minn.

BUILDING PERMITS.—German Lutheran brick church, s s of Dearborn St., between Goff and Gorman Aves.; cost, $5,000.

Two-st'y brick block of stores and dwells., cor. Wabasha and St. Peter Sts.; cost, $11,000; owner, Wm. Dunlap.

Two-st'y frame dwell., s s of Albion Ave., between Waltham and Feronica Sts.; cost, $2,000; owner, Chas. G. Smith.

Two-st'y brick furniture-factory, s s of Railway, between Hampden and Railway St.; cost, $10,000; owners, Hall & Brace.

Two-st'y frame block of dwells., s e cor. Exchange and Elm Sts.; cost, $7,800; owners, F. W. & R. M. Hunter.

2 Two-st'y frame dwells., s s of Goodrich Ave., between Western and Dousman St.; cost, $4,150; owner, Clara M. Wilkes.

Two-st'y frame dwell., n s of Ramsey St., between Forbes and Pleasant St.; cost, $3,500; owner, Mrs. Ida A. McManus.

One-and-one-half-st'y frame dwell., n s of Merriam Ave., near Backus St.; cost, $2,100; owner, Ed. Scott.

ST. PAUL & NORTHERN PACIFIC RAILROAD.—Brick office and store-house, cost, $11,000; car-erecting and wood-working shop, cost, $30,000; brick coach repair-shop, cost, $11,000; brick machine-shop, cost, $13,000; brick shaving and dust tower, cost, $3,000, brick engine-house, cost, $2,000; brick smoke-stack; cost, $5,500; blacksmith shop, cost, $8,000; freight repair-shop, cost, $15,500; dry kiln, cost, $4,000; boiler-house, cost, $7,000; brick boiler-house, cost, $2,000; coal and iron storehouse, cost, $3,000; brick paint-shop, cost, $30,000; brick paint stock room, cost, $3,500; brick laboratory, cost, $2,200. Total, $153,700.

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BUILDING INTELLIGENCE.

General Notes.

CAMBRIDGE, MASS.—The Board of Aldermen has appropriated $6,500 for the purchase of the Lee-street Church building, and $11,000 additional for repairs of the building for classical high school purposes.

MALDEN, MASS.— There is talk of building a house for the Grammar School at Maplewood.

MARION, VA.— McDonald Bros., of Louisville, Ky., are the architects of the State Asylum for the Insane, which is to be built here.

MILWAUKEE, WIS. — Mrs. Alexander Mitchell's Art School Building; cost, $2,500; John Calvin Stevens, architect, Portland, Me.

NEW HAVEN, CONN. — Following are the Building Permits for New Haven for week of July 11, of over $3,000 value:

Mr. M. Flagg, three two-st'y frame dwells., 20′ x 34′, Kimberly Ave; $6,000.

M. F. Patunce, two-st'y store and tenement-house, 30′ x 36′, Greenwich and Kimberly Aves.; cost, $3,000.

N. H. Hoyt, Jr. is building a two-st'y double frame dwell. on Howard Ave., 35′ x 52′, to cost $5,000.

Hiram Camp is building a frame church on Ferry St., 48′ x 84′; to cost $10,000; L. W. Robinson, architect.

PALISADES-ON-HUDSON, N. Y.—Cottage for Mr. Wm. S. Opkyke; H. G. Knapp, architect, New York.

SHENANDOAH, PA. — The corner-stone of the first Uniate Greek church built in America was laid here July 19, by Father Walenski, pastor of the congregation of that denomination at this place.

SPUYTEN DUYVIL, N. Y. — A block of six semi-detached cottages is about to be built for Mr. Wm. E. Lawton; H. G. Knapp, architect, New York.

TARRYTOWN, N. Y. — Three cottages for Mr. J. F. Harman; H. G. Knapp, architect, New York.

TRENTON, N. J.—It is said to be now certain that a new capitol for the state of New Jersey will be built here. The agitation for removing the capital to Newark never amounted to anything, and it is better for many reasons to retain it at Trenton. The new building will be on the site of the old one, down by the river, and will be one-half larger than its predecessor. It is expected that work will be begun before snow flies. No attempt will be made to rival the Capitol at Albany, either in size or in cost. The building ought not to cost over $1,000,000.

COMPETITION.

Monument to the Memory of

General Grant.

For particulars see page 66 this issue.

PROPOSALS.

RETAINING WALLS.
[At North Becket, Mass.]

BECKET, MASS., August 1, 1885.

The undersigned will receive sealed proposals, indorsed "Proposals for Building of Retaining Wall, Filling and Grading the Cemetery at North Becket," **until August 15, 1885, at 2 o'clock**, P. M. Plans and specifications can be seen at the house of Wm. W. Prentice in Becket, and any information given by any of the committee.

The committee reserve the right to reject any and all proposals.

W. W. PRENTICE,
FREDERICK SNOW,
WM. H. SNOW,
} Cemetery Committee.

502

POLICE STATION.
[At Montreal, Can.]

CITY CLERK'S OFFICE, CITY HALL,
MONTREAL, July 30, 1885.

Sealed tenders addressed to the undersigned, will be received at the City Clerk's office, City Hall, **until Friday, the 14th day of August next, at noon**, for sundry artificers' works required in the erection of a new police station, Chaboillez St., according to plans and specifications to be seen at the office of Messrs. Perrault & Mesnard, Architects, No. 11 Place d'Armes Hill.

The lowest or any tender will not necessarily be accepted. By order,

CHAS. GLACKMEYER,
502 City Clerk.

HEATING, PLUMBING, MASONRY, ETC.
[At Cincinnati, O.]

OFFICE BOARD OF TRUSTEES TO REBUILD COURT-HOUSE, HAMILTON COUNTY, O., SOUTH COURT-HOUSE YARD, CINCINNATI, O., Aug. 1, 1885.

Sealed bids will be received at this office **until Wednesday, August 19, 1885, at 9.30 o'clock**, A. M., for furnishing the heating and ventilating work, plumbing, gas-piping, electric-light wires, and the following for boiler-house: excavations, limestone masonry and brick work, iron-work and skylights.

In rebuilding the court-house in Hamilton County, O., according to plans and specifications on file at this office, and at the office of Jas. W. McLaughlin, Architect, Nos. 46 and 47 Johnston Building.

The bids must be made on the blanks that will be furnished on demand by said Board.

The Board reserves the right to reject any and all bids. By order of the Board.

503 J. CLIFFORD GOULD, Clerk.

WATER-PIPE HYDRANTS, ETC.
[At Randolph, N. Y.]

Sealed proposals will be received at the office of the Secretary of the Water Commissioners of the village of Randolph, N. Y., **until noon of August 20th**, for furnishing materials and constructing water-works for and in same village, approximately as follows:

7,500 lineal feet 8-inch iron pipe.
9,000 " " 6 " " "
4,000 " " 4 " " "

Fifteen fire-hydrants, special castings, gates, valves, lead for the joints, etc., including the delivery of such materials where needed, the digging of trenches and laying the pipe and setting the fire-hydrants.

The whole of said materials and work to be more fully described by specifications and detailed drawings, which will be ready for the use of bidders, and furnished on application on and after August 5.

The Commissioners reserve the right to make such modifications in the above quantities, or magnitude of the work, as may be deemed advisable, after receiving proposals.

The right is also reserved to reject any and all bids.

G. E. SEAGER, Sec'y of Water Commissioners.

503

PROPOSALS.

JAIL.
[At Montgomery, Ala.]

OFFICE OF THE BOARD OF REVENUE, OF MONTGOMERY COUNTY, MONTGOMERY, ALA., July 28, 1885.

Sealed proposals will be received by the Board of Revenue of Montgomery County, Ala., **until 12 M., Monday, September 7th, 1885**, for the erection and completion of a new brick jail building, containing twenty-four steel cells in the City of Montgomery, Ala.

Bids will be received for the entire work, or separately for the iron and steel part, and for the different parts of the building.

The drawings and specifications can be seen at the office of the Board of Revenue, Montgomery, Ala., and also at the office of Bruce & Morgan, Architects, Atlanta, Ga. The Board of Revenue reserves the right to reject any or all bids.

W. H. HUBBARD,
506 Clerk.

BEACON.
[Near Baltimore, Md.]

OFFICE OF THE LIGHTHOUSE ENGINEER, FIFTH DISTRICT, BALTIMORE, MD., August 1, 1885.

Sealed proposals will be received at this office **until 12 o'clock, M., of Saturday, the 15th day of August, 1885**, for furnishing the materials and labor of all kinds necessary for the completion and delivery of the metal-work of the Rear Beacon, Craighill Channel Cut-off.

Plans, specifications, forms of proposal, and other information may be obtained on application to this office.

The right is reserved to reject any or all bids, and to waive any defects.

JARED A. SMITH,
502 Lighthouse Engineer, Fifth District.

REFORMATORY.
[At Elmira, N. Y.]

ELMIRA, N. Y., July 28, 1885.

Sealed proposals are solicited for the construction of an extension to the New York State Reformatory at Elmira, according to drawings and specifications by J. R. Thomas, Architect, of New York city.

Bids will be received **until Saturday, August 15, at noon**, separately for the different classes of work or for the entire work in gross. Each bid must be accompanied by a check certified by a responsible bank, or a draft on the City of New York, payable to the Treasurer of the Board of Managers, M. H. Arnot, to an extent of five (5) per cent of the amount of the proposal as a guarantee that the party making the bid will enter into a contract for the execution of the work. The parties to whom contracts may be awarded will be required to furnish satisfactory bonds in an amount equal to one-half of the contract.

Drawings and specifications can be seen at the office of the superintendent at the Reformatory.

Proposals are to be addressed to John I. Nicks, President of the Board, Elmira, N. Y.

The Board reserves the right to reject any or all proposals.

By order of the Board of Managers.

JOHN I. NICKS,
M. H. ARNOT,
502 Committee.

PROPOSALS.

JOINER-WORK, ETC.
[At Poughkeepsie, N. Y.]

OFFICE OF SUPERVISING ARCHITECT, TREASURY DEPARTMENT, WASHINGTON, D. C., August 1, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 24th day of August, 1885**, for furnishing and fixing in place all the joiner work, wood flooring, glass, hardware and painting and polishing required for the post-office, etc., building at Poughkeepsie, N. Y., in accordance with drawings and specifications, copies of which and any additional information may be had on application at this office or the office of the superintendent.

Bids must be accompanied by a certified check for $300.

M. E. BELL,
502 Supervising Architect.

SCHOOL-HOUSE.
[At Wilbraham, Mass.]

The undersigned will receive sealed proposals—marked proposals—for the furnishing the materials and building a school-house for the town of Wilbraham, near Ludlow Mills, **until 2 o'clock**, P. M., **Thursday, August 13.** Plans and specifications can be seen at the house of Henry Clark, on West St., Wilbraham, also at P. P. Potter's, near Three Rivers.

The selectmen reserve the right to reject any or all proposals.

M. F. BEEBE, HENRY CLARK, P. P. POTTER, } Selectmen of Wilbraham.

502

VAULTS AND SAFES.
[At Washington, D. C.]

OFFICE OF SUPERVISING ARCHITECT, TREASURY DEPARTMENT, WASHINGTON, D. C., July 22d, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 10th day of August, 1885**, for furnishing all the safe and vault work required for the public buildings under control of the Treasury Department during the fiscal year ending June 30, 1886, in accordance with drawings and specification, copies of which and any additional information may be obtained at this office.

Bids must be accompanied by a certified check for $500.

M. E. BELL,
502 Supervising Architect.

STEAM-BOILERS.
[At Leavenworth, Kans.]

THE NATIONAL HOME FOR DISABLED VOLUNTEER SOLDIERS, WESTERN BRANCH, LEAVENWORTH, KANS., July 23, 1885.

Sealed proposals will be received at the Planter's House in this city **until 12 o'clock, noon, August 15th, 1885**, for furnishing delivered on the grounds seven (7) steam-boilers, according to plans and specifications which may be seen at the office of Carr & Grodavent, architects, Leavenworth, on and after July 25.

The right to reject any or all bids is reserved.

GEN. W. B. FRANKLIN, President.
502 E. F. BROWN, Inspector-General.

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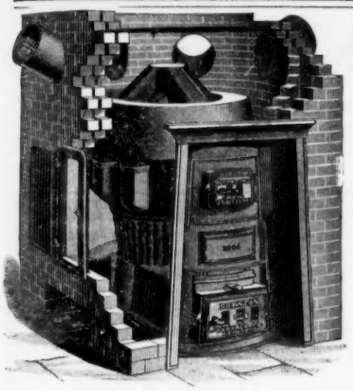

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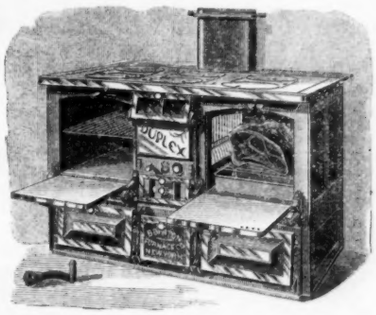

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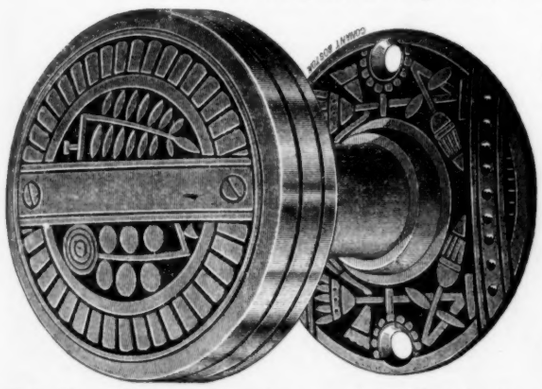

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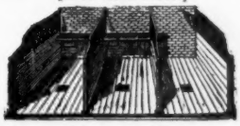

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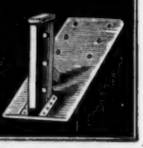

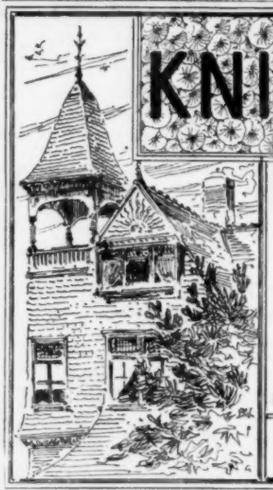

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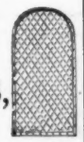

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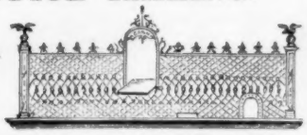

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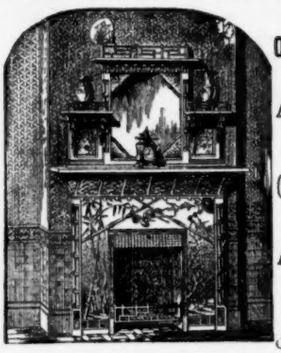

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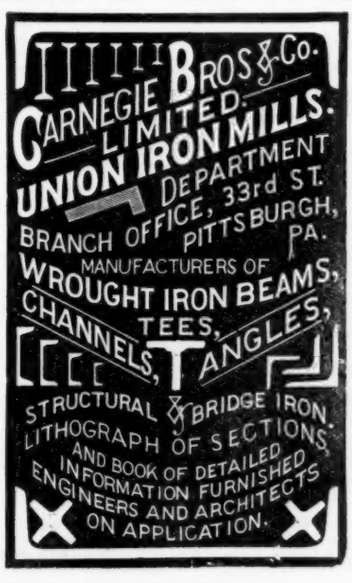

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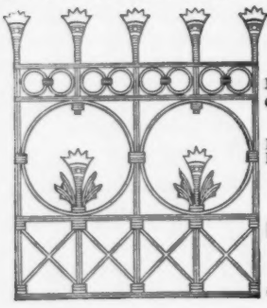

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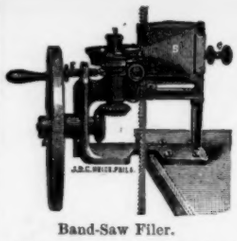

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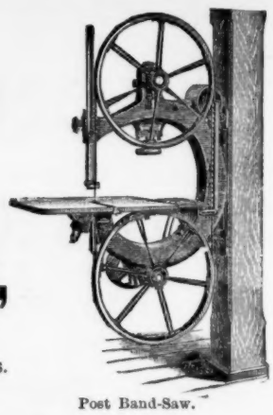

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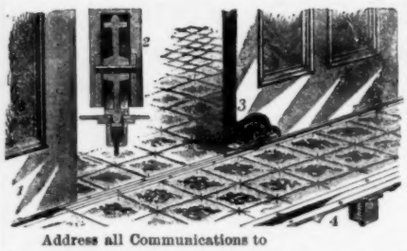

Figure 1 shows door open with centre rail level with floor. Figure 2, section of sheave, showing its position on rail. Figure 3 shows door closed with sheaves placed and centre rail depressed. Figure 4 shows track running off in the recess.

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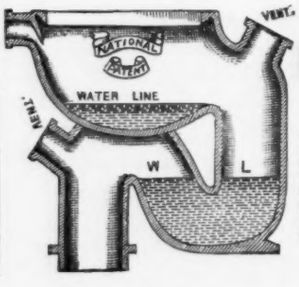

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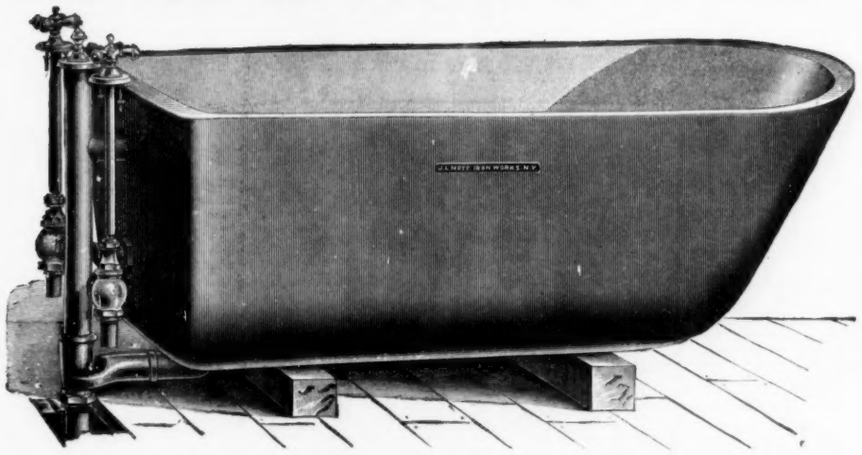

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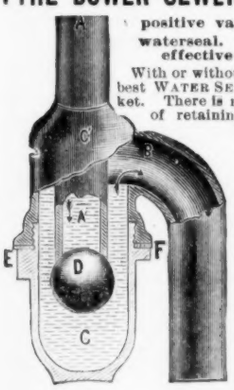

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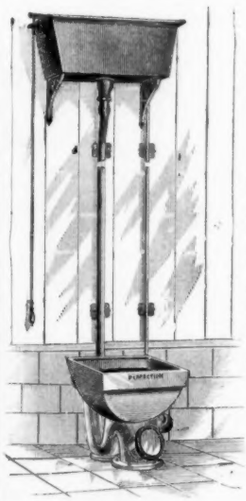

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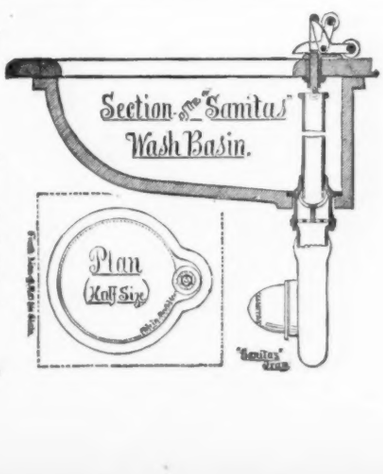

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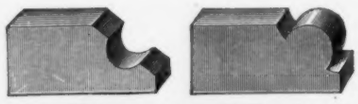

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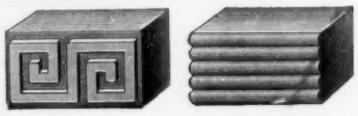

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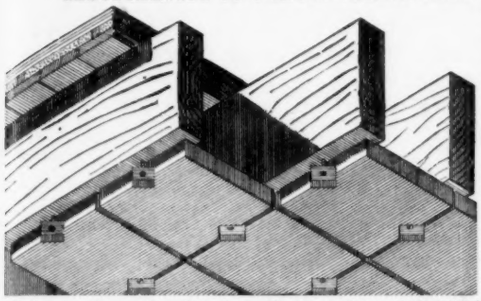

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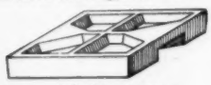
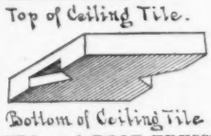


Top of Ceiling Tile.



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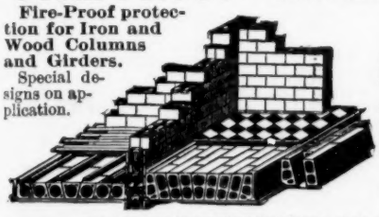

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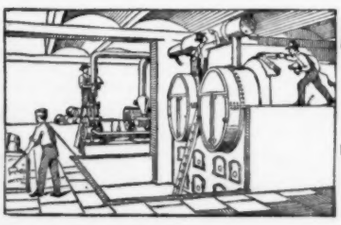

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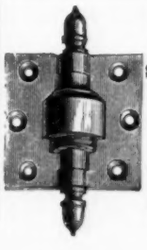

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